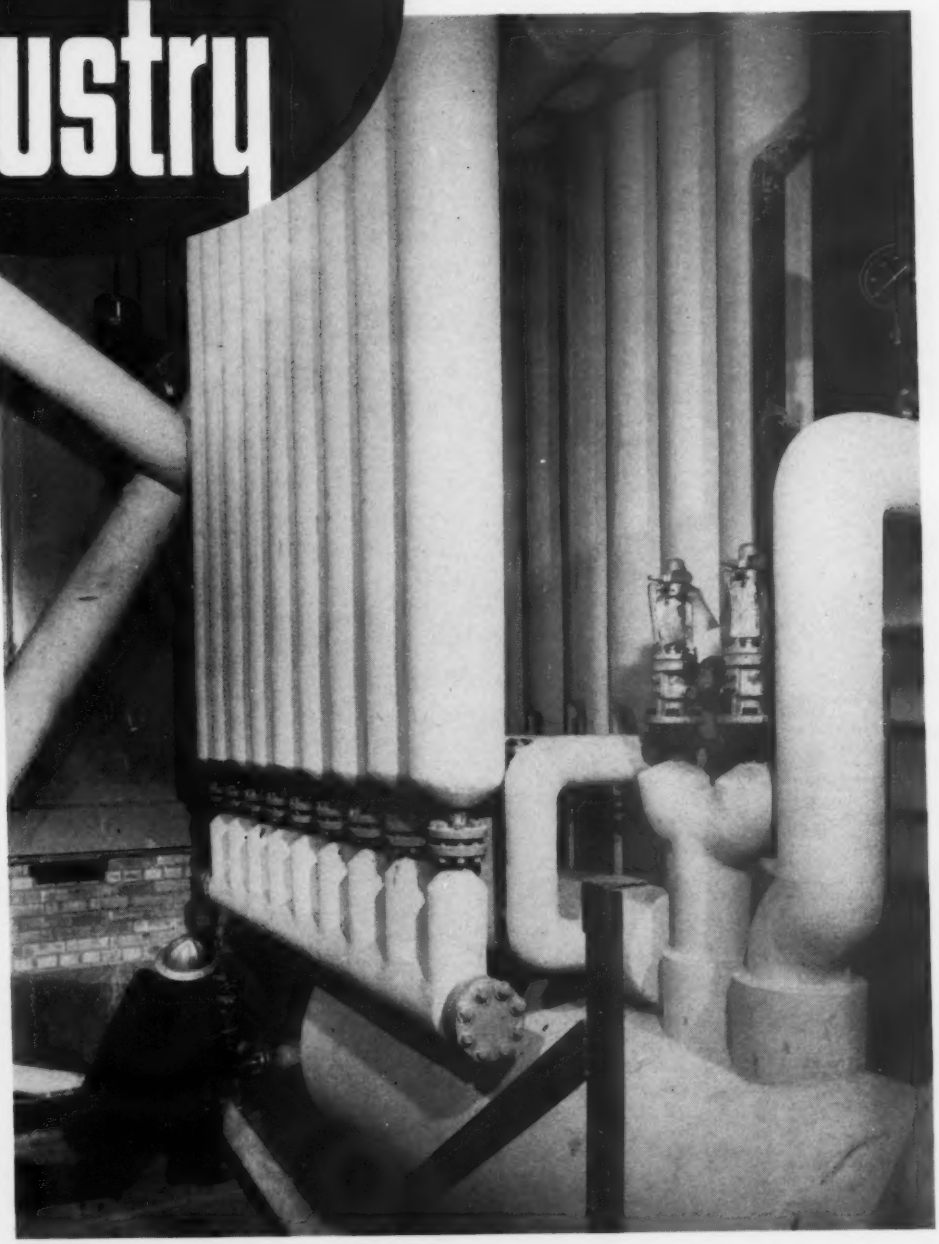
Western Industry

September 1953



The first production of electrical power from atomic energy was accomplished by this unique steam generator located at the National Reactor Testing Station, Idaho Falls, Idaho
... see page 24

FOR RESULTS—
use teams... p. 29; choosing your speed reducers... p. 36; testing tips... p. 39

You get more from CABCO

Uniformity...equal strength, equal size, equal lightness. Cabco engineers go to great lengths to insure precise uniformity in every kind of shipping container we make. From timber-stand to finished product, we perform every step ourselves. This one-company supervision of manufacture assures that every Cabco wirebound you buy gives your product the travel protection you want. This high order of uniformity is another reason why Cabco is the West's foremost manufacturer of wooden shipping containers—and has been since 1883.

CUSTOM DESIGNED DOUBLE-MAT CABCO wirebound crate for 275 lb. Wesix electric water heater saves 50 lbs. shipping weight, 45 minutes assembly time over nailed crates. Double mats are joined firmly by 2 channel blocking pieces at the mid-point. Wire loop closures insure quick opening and closing for inspection. Top and bottom blockings are cut round to grip heater snugly. Wirebounds stack flat, save storage space.

Sold only by

DUFF CALIFORNIA CO.

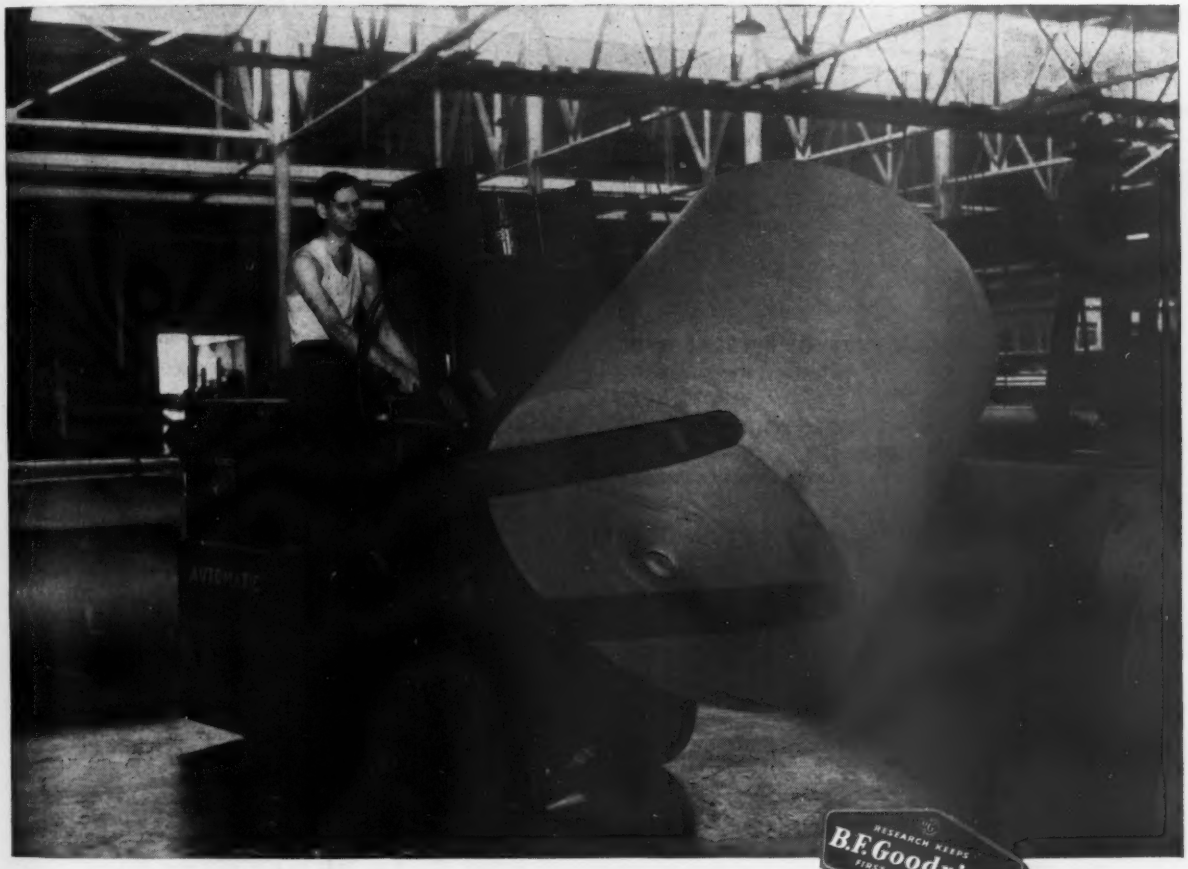
100 Bush Street, San Francisco 4 • 2581 E. Eighth Street, Los Angeles 23
501 Dooly Building, Salt Lake City 1

2761

Cabco containers are a product of the California Barrel Company, Ltd., the West's foremost designer and manufacturer of wooden shipping containers

B.F.Goodrich

TW TIRE AND WHEEL ANALYSIS man puts an end to unnecessary industrial tire cutting, chipping



Save as much as 50% on tire costs

Debris-strewn floors, sharp projections along trucking aisles or on the trucks themselves, overloading and collisions all can cut and chip an industrial tire. Or tire failure may be caused by the tire being used on a job for which it was never designed.

The B. F. Goodrich Tire and Wheel Analysis man can put an end to unnecessary tire troubles, can save you up to 50% on industrial tire costs. He knows which tire is right for any given set of operating conditions —solid, semi-pneumatic or pneumatic—which tread design and compound is best to use. Without obligation, he will put his training to work on your problems, recommend the right tires for you to use, give you maintenance tips that can cut costs as much as 20%.

The TW Analysis man's advice is impartial, for B. F. Goodrich makes, and BFG retailers sell, a complete line of industrial tires. Use the tires he recommends and save yourself unnecessary tire expense. Get increased, maybe even doubled, tire life.

To find out more about this free B. F. Goodrich Tire and Wheel Analysis Plan, send in the coupon or call your BFG retailer. A special TW Analysis Plan is available for manufacturers of industrial handling equipment.

Specify B. F. Goodrich tires when ordering new equipment

The B. F. Goodrich Co.
Department TW-160, 5400 E. Olympic Blvd.
Los Angeles 22, California

Please send me:

☐ *Additional information* on your new Tire and Wheel Analysis Plan.

☐ A free copy of your "Industrial Tire Guidebook".

Name_____

Title_____

Company_____

City_____ State_____

Western Industry

CONTENTS

SEPTEMBER • 1953

Volume XVIII, Number 9

ARTICLES

TEAMWORK PAYS OFF 29
Iron Fireman demonstrates its system's benefits for manufacturers and employees alike

DESIGN PROBLEM—COMPACT COMBINATION KITCHEN . . . 32
Production and design engineering know-how results in sink-stove-refrigerator all rolled into one unit

ARABOGALACTAN 34
Another Western forest product

AUTOMATIC LOADER CONVEYOR KEEPS REDWOOD LUMBER DRY 35
Geneva Lumber Co. reduces damage, loading and unloading costs with home grown loader for lumber.

HOW TO GET THE MOST FROM YOUR POWER TRANSMISSION EQUIPMENT 36
The first of three installments on speed reducers dealing with selection and maintenance of equipment

SQUEEZING THE MOST FROM EACH KILOWATT HOUR 39
Tips on electrical testing

INDUSTRIAL ENGINEERS AS MANAGEMENT POTENTIAL . . . 40
How to find 'em and train 'em properly

PREVENTIVE MAINTENANCE BEATS LOGGING DOWN-TIME COSTS 44
Regular scheduling of equipment repairs reduces costs and increases safety

MASS PRODUCTION AND JOB SHOPWORK INTEGRATED . . . 49
How National Screw & Manufacturing Co. maintains quality and production under a dual production operation

ANNUAL APPRENTICESHIP CONFERENCE 54
Progress is reported but need for more activity is stressed

YOUR COMPANY LIBRARY 62
How Bethlehem Pacific Coast Steel Corp. organized library services to fit needs of all departments

RESISTANCE WELDING 73
Cuts time, weight and number of defects

DEPARTMENTS

Editorials 20
Letters 22
This Month's Cover . . . 24
Calendar of Meetings . . . 26
Helpful Literature 88
Materials and Equipment . . 93
Westerners at Work . . . 107
Associations Elect 110
Western Trade Winds . . . 111
Books for Industry 114
Classified Advertising . . . 115
The West On Its Way . . . 117

ADVERTISERS IN THIS ISSUE 116

Editor
A. C. PRENDERGAST

Managing Editor
John J. Timmer

Assistant Editor
Robert S. Wood

News Editor
Patricia N. Mann

Consulting Technical Editor
C. LLOYD THORPE

Consulting Editor
Electricity and Electronics
ROY C. HENNING

Consulting Editor
Industrial Development Planning
W. J. O'CONNELL

Correspondents
O. N. Malmquist
c/o Salt Lake Tribune
Salt Lake City 1, Utah

L. E. Thorpe
604 Medical Arts Bldg.
Seattle 1, Wash.

District Offices

NEW YORK OFFICE
Richard J. Murphy, Eastern Manager
107-51 131st Street
Richmond Hill 19, New York
Telephone Jamaica 9-2651

CLEVELAND OFFICE
Clifford E. Beavan, District Manager
3307 E. 149th St., Cleveland 20, Ohio
Telephone SKyline 1-6552

CHICAGO OFFICE
A. C. Petersen, District Manager
3423 Prairie Ave., Brookfield, Ill.
Telephone Brookfield 532

SAN FRANCISCO OFFICE
V. C. Dowdle, District Manager
609 Mission St., San Francisco 5, Calif.
Telephone YUkon 2-4343

LOS ANGELES OFFICE
Jerome E. Badgley, District Manager
128 So. Mansfield Ave., Los Angeles 36
Telephone WEbster 8-8512

PACIFIC NORTHWEST
Arthur J. Urbain, District Manager
609 Mission St., San Francisco 5, Calif.
Telephone YUkon 2-4343

25c per Copy $2.00 per Year

Published Monthly by
KING PUBLICATIONS
609 Mission Street
San Francisco 5, Calif.
Telephone YUkon 2-4343

James I. Ballard . . . . President
Franklin B. Lyons . Vice President
L. P. Vrettos . . V. P. & Treasurer
E. F. Hubbard . . Circulation Mgr.
Maida Rector . . Production Mgr.

Please address all communications to the San Francisco Office

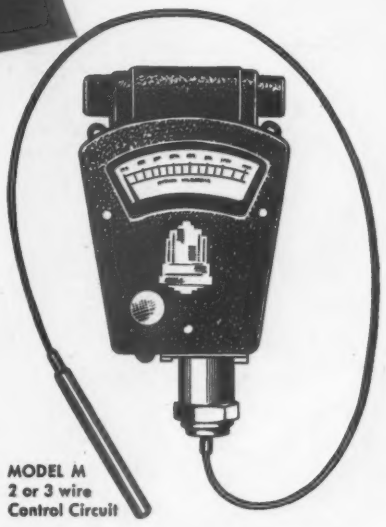
Acceptance under Section 34.64
P. L. & R. authorized.

Copyright, 1953 by King Publications.

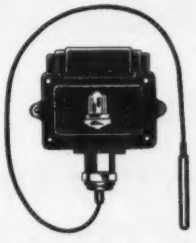
where Temperature is measured and controlled, you'll find PARTLOW

PACIFIC SCIENTIFIC CO. has a stock of Partlow controls in each of its 4 offices for immediate delivery. Repair, recalibration and instrument testing by competent engineers is available, with expert counsel on your control problems. Call the nearest office for prompt assistance.

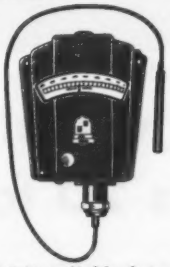
FLUID, SOLID, AIR, GAS...if they need measurement or control, from 30° below zero to 1,050° above zero, F., there's a specific Partlow instrument to serve you well. Partlow controls operate from the famous Partlow Mercury Actuated Flexible Control Element. Partlow controls are extremely accurate and durably constructed to withstand rigorous industrial use, many users tell of 20 years service records. Partlow controls can be used to open and close switches, valves, latches, can be used to record and regulate the temperature of water, molten metal, acid, in ovens, and many other uses. Write or call Pacific Scientific Co. for full information.



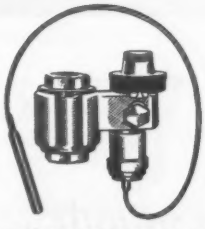
MODEL M
2 or 3 wire
Control Circuit



THE S-M CONTROL is used as a limit switch either re-cycling or manual reset. Can be set to operate at a fixed temperature, and it will do its job indefinitely, until changed. Both indicating and dial type.



MODEL L-P, suitable for modulation of motorized valves, through a potentiometer, incorporated in the control. Made like all Partlow controls, to take the rough usage of industry, and give long, accurate service.



LOW PRESSURE CONTROL 40K, used primarily for regulation of deep fat pots, water boilers, and other devices where electricity is not available or desirable. Designed to give years of accurate service with hard usage.

Pacific SCIENTIFIC CO.

LOS ANGELES 1430 Grande Vista Ave. **SEATTLE** 1915 1st Ave. South
SAN FRANCISCO 25 Stillman St. **PORTLAND** Terminal Sales Bldg.
ARLINGTON, TEXAS 806 East Abram St.

For product information from these manufacturers call Pacific Scientific Co.: AUTOMATIC TEMPERATURE CONTROL CO., COATES ELECTRIC CO., INDUCTION HEATING CO., LEWIS ENGINEERING CO., LINK ENGINEERING CO., THE MB MANUFACTURING CO., PARTLOW CORPORATION, TINIUS OLSEN TESTING MACHINE CO., WILSON MECHANICAL INSTRUMENT DIVISION (American Chain & Cable Co.)

OSBORN

This wheel of fortune pays 20 to 1 on every turn

In one minute this machine does a job that formerly required 30 minutes! It shows what *you* can do with new OSBORN Power Brushing techniques to speed *your* production and cut costs.

The job consists of deburring ends of stainless steel blades of a jet engine stator assembly. Chucked up in a grinder, as shown, the assembly rotates counter-clockwise at 20 rpm. An 8-inch grinding wheel grinds the ends of the vanes. Burrs and feather edges are then removed by two OSBORN 10-inch Monitor® Brushes rotating at 2800 rpm—45 seconds in each direction. The complete cycle takes 1½ minutes. Vane ends are made uniformly smooth, 20 times as fast as former hand method.

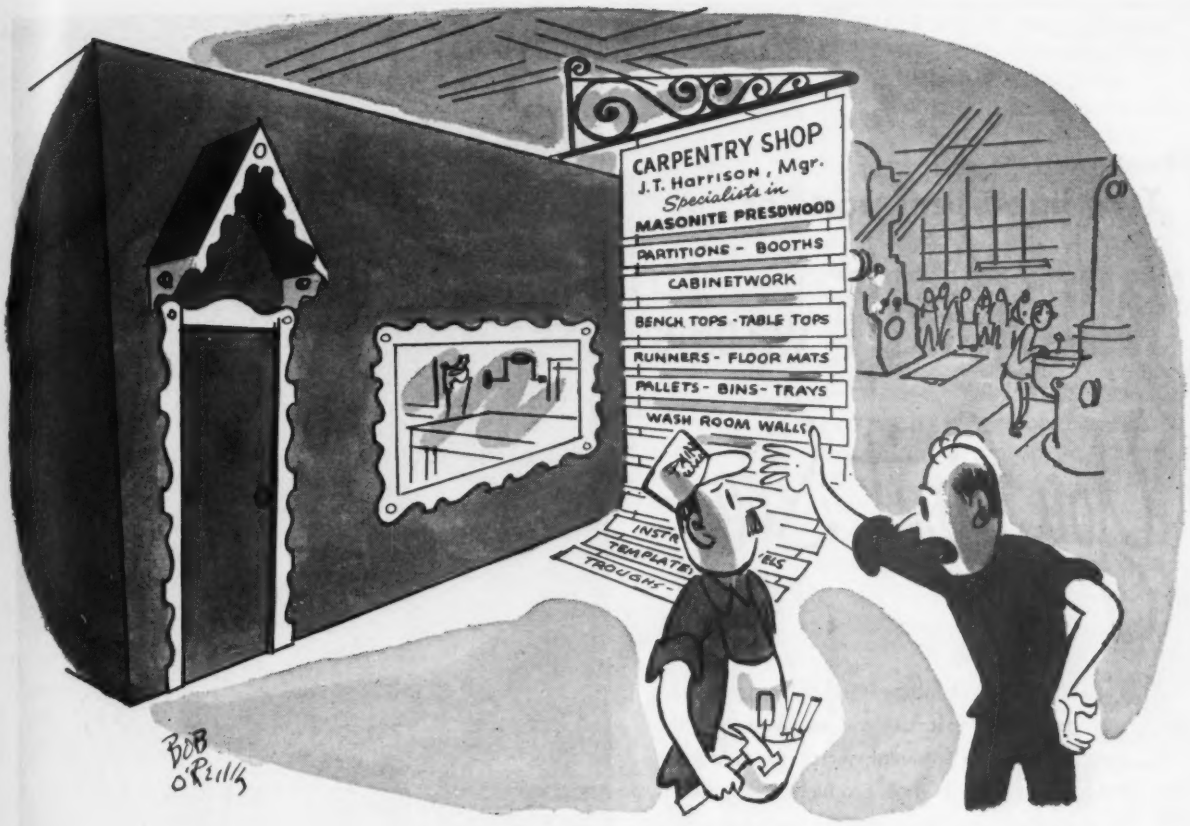
The answer to *your* production problems may be found with special Osborn-equipped machines such as this . . . or with one of the Osborn Brushing Machines which are being used in scores of plants for high-speed deburring. For *any* problem in deburring, cleaning and finishing, start tackling it with the powerful experience of your **O**sborn **B**rushing **A**nalyst. Call him or write *The Osborn Manufacturing Company Dept. Q-5, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

FREE: New booklet on deburring with Osborn Power Brushing. Write for your copy.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

CARRIED IN STOCK BY LEADING INDUSTRIAL DISTRIBUTORS IN WESTERN STATES



"Yes, Jerry, I'm glad you like **MASONITE PRESDWOOD,** *but after all..."*

all through the plant...

MASONITE PRESDWOOD

solves maintenance problems!

You can't blame a man for trying. Once he gets acquainted with Masonite Presdwood and learns how many different jobs it can do better . . . it's hard not to be enthusiastic.

Especially when you realize that there are so many different types and thicknesses for doing so many jobs better. Tempered and standard panels, panels smooth on both sides, textured panels—there are 33 varieties in all.

Our free booklet will guide you to greater maintenance economies with these versatile all-wood hardboards. Send the coupon today. Then stop in at your local building materials dealer for the type and thickness of Masonite Presdwood® you need.

WESTERN HARDBOARDS FOR WESTERN INDUSTRY

MASONITE® CORPORATION

Dept. WI-9, 111 Sutter St., San Francisco 4, California

Please send me your brochure on "How to Improve Factory Methods with Masonite Presdwood."

Name.....

Firm.....

Street.....

City.....*Zone*.....

County.....*State*.....

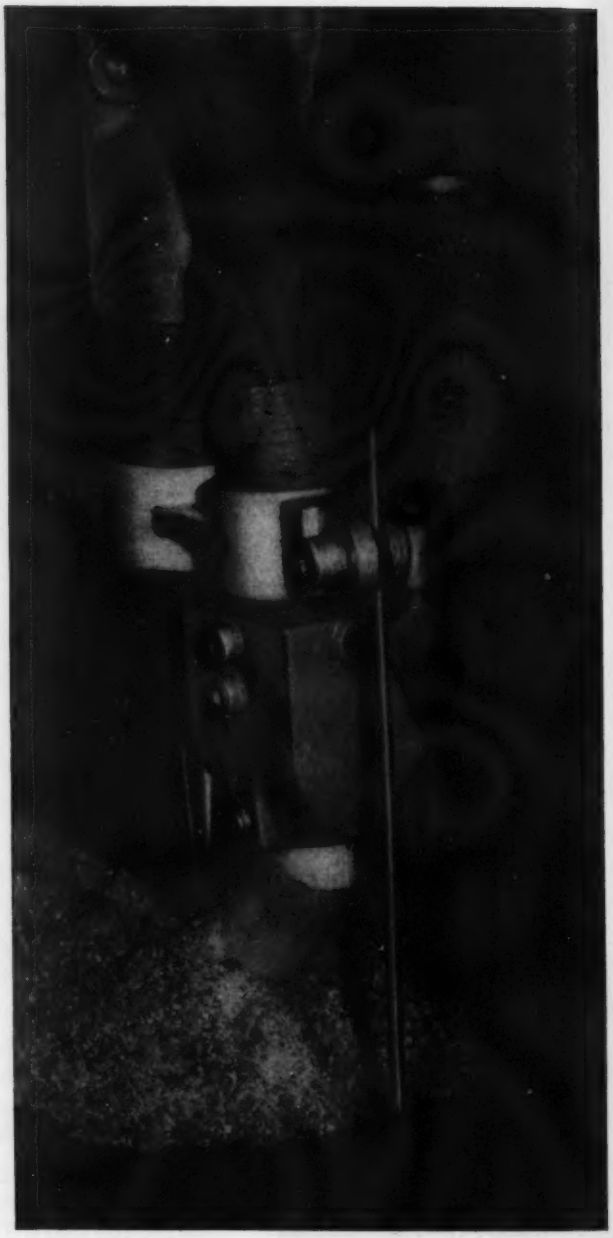
"Masonite" signifies that Masonite Corporation is the source of the product

Two important parts of

UNIONMELT WELDING

Trade-Mark

You Can't See



This is UNIONMELT welding—instantly recognized by the special granulated material you see blanketing the weld. *You can't see* the powerful electric arc that fuses the metal beneath at the highest production rate attainable. No sparks or glare disrupt nearby plant activity.

You can't see the LINDE SERVICE that stands behind every UNIONMELT installation to assure its efficient and profitable operation. Only LINDE can give you this unique combination of research, engineering, and over 40 years of welding know-how that is helping LINDE customers save money and improve production. And only LINDE can give you the accumulated benefits of more than 18 continuous years of development, field testing, and improvement in the field of submerged melt welding where it pioneered.

LINDE's Service Engineers will gladly help you design a UNIONMELT installation to meet your exact requirements. They will also be available to help you when a tough production problem comes up. Call your nearest LINDE representative today.

Linde
TRADE-MARK

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The terms "Linde" and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

High Production at Low Cost Demands the Right Lubricant for each job.
THAT'S RIGHT, JIM... GENERAL PETROLEUM HAS THE MOST COMPLETE LINE OF INDUSTRIAL LUBRICANTS OF ANY COMPANY.
YES, BUT WON'T THAT COST ME A LOT MORE MONEY?
NOT AT ALL... THE FEW EXTRA PENNIES YOU SPEND FOR THE RIGHT LUBRICANTS COULD SAVE YOU THOUSANDS OF DOLLARS IN DOWN-TIME... LOTS MORE THAN YOUR TOTAL LUBE PURCHASES FOR TWO WHOLE YEARS.
WELL, YOU HAVE A POINT THERE.
NOT ONLY THAT, OUR LUBE ENGINEERS HAVE THE KNOW-HOW IT TAKES TO ASSURE YOU OF GETTING HIGH PRODUCTION AT LOW COST.
THAT'S WHY G.P. LUBRICANTS, MORE THAN ANY OTHERS, ARE SPECIFIED BY EQUIPMENT MANUFACTURERS ON THEIR RECOMMENDATION PLATES.
MODEL C-27
McKENZIE TOOL CO.
SERIAL 16921-C
LOS ANGELES, CALIFORNIA
SOUNDS LOGICAL ENOUGH TO ME, DON... AND I'VE HEARD ABOUT YOUR FINE SERVICE. LET'S GIVE IT A WHIRL!
Large or small, your plant will benefit from General Petroleum's policy of the RIGHT lubricant in the RIGHT place at the RIGHT time. Backed by more than 25 years of lubrication experience, G. P. today serves most of the West Coast's leading industrial plants. Call your nearest G. P. office today for a discussion of your production problems.
SOCONY-VACUUM
GENERAL PETROLEUM CORPORATION
converting natures gifts for better living
11-39

Today's most dependable price tag

Maybe there was a day you could take quality for granted in buying plant equipment. But you weren't faced with today's fast-multiplying, high maintenance costs that can quickly cancel out first cost values.

Today's opportunity for thrifty buying is not in the price, but in greater assurance of quality. In piping equipment, for example, it's the ultimate cost that determines real value . . . not what you pay for it.

That's why thrifty buyers prefer Crane—the traditionally better quality piping materials. With each Crane valve or fitting installed, there's greater assurance of longer life, dependability, freedom from repairs . . . and Crane puts such quality into piping equipment for every industry.

Crane Co., *General Offices:* 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas.

CRANE

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

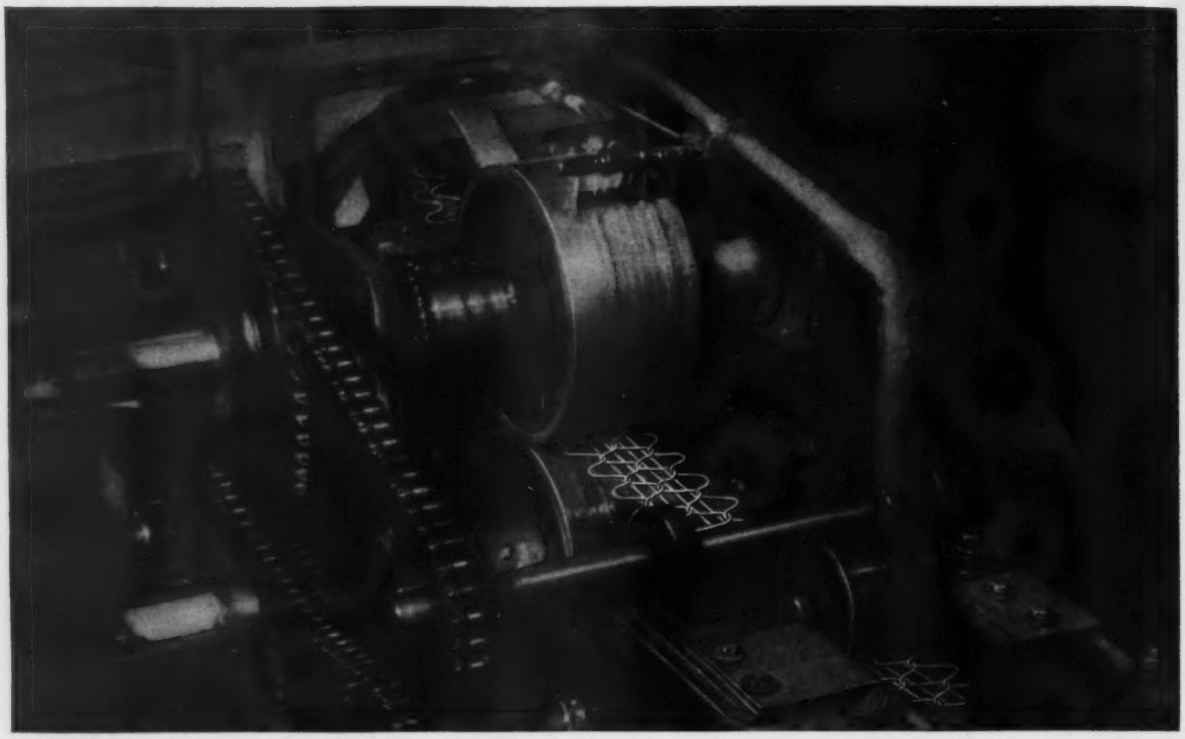
Lost your shirt on hidden lighting cost?

Don't let it happen again.
Buy the QUALITY line with "plus" values on the price tag.

SIMPLIFIED INSTALLATION EFFICIENCY
SOUND ENGINEERING
EASY MAINTENANCE DEPENDABILITY

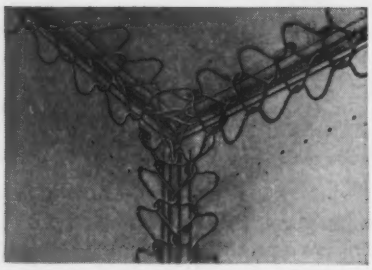
Remember . . . You get only what you pay for . . . and buying on price alone can be costly.

Next time look to..... SMOOT-HOLMAN .....for quality



This high-speed wire mesh machine electrically welds together eight separate strands of high quality U·S·S Manufacturers Wire in making self-furring plaster reinforcing at the Ray F. Stockton Co., Inc. in Burbank, California.

New plaster reinforcing gives greater strength



Inside corners and ceiling angles are stronger and truer when these plaster reinforcing strips are used. Besides the 18-gauge wire used here, there are more than 1000 other types, grades & finishes of U·S·S Manufacturers Wire available. Columbia-Geneva also can produce tailor-made wire to your specifications.

Reels of wire feed continuously into the wire mesh machine. The company uses over 125 tons of U·S·S Manufacturers Wire every month in fabricating this product. Columbia-Geneva, with the greatest wire-making facilities in the West, produces wire for everything from coat hangers to heavy, woven fencing.

Ray F. Stockton, right, President of the company, is shown here examining a coil of wire with a Columbia-Geneva specialist. Mr. Stockton reports, "We're completely satisfied with the performance we've gotten from U·S·S Manufacturers Wire. It forms easily, and is always of uniform high quality."

For uniform, high-quality wire, rely on U·S·S Manufacturers Wire. It's production is rigidly controlled by United States Steel from raw ore to the finished product. Columbia-Geneva specialists are always available to help you select the wire that's right for your job. For information write to Columbia-Geneva Steel Division, United States Steel Corporation, 1403 Russ Building, San Francisco 6.

Columbia-Geneva produces wire that's tailored to fit your needs

USS

U·S·S Manufacturers Wire

Columbia-Geneva Steel Division, United States Steel Corporation, San Francisco

UNITED STATES STEEL

More VALVE for your money!

If you are now using COOPER ALLOY stainless steel valves you know all about the plus factors in quality and design that are yours at no extra cost. If you are using any other brand, you owe it to yourself to get the facts and make the comparison. For the full story on how competitive 2" gate valves designed for the same service differ in important service features, write for your free copy of the 2" valve Comparison Chart.

STAINLESS STEEL VALVE COMPARISON CHART

BASED ON 2" GATE	COOPER ALLOY	COMPETITORS A	B	C
Ball and socket rotating type disc for positive seating with minimum galling	✓	✓		
Discs and seats designed for simple reconditioning in the field	✓	✓		
Centerless ground stock to cut packing wear	✓	✓		
¾" minimum stem diameter to assure rigidity	✓		✓	✓
Deep stuffing box with six turns of ¼" square packing	✓		✓	
Packing gland designed to deliver square, uniform compression	✓			
Two piece gland construction to prevent gouging of the stem	✓	✓		✓
Swinging eyebolts to simplify repacking and provide added safety	✓			
Simplified yoke nut construction to permit replacement without interrupting service	✓			✓
Grease fitting to eliminate friction on yoke nut during opening and closing	✓			
100% x-ray of vital cast components	✓			
A stainless steel valve designed and produced by stainless steel specialists	✓	✓		
Stocked in major industrial areas by nationwide distributor organization	✓		✓	✓
Rugged construction for tough corrosive service—compare these weights!	33 lbs.	28 lbs.	28 lbs.	24 lbs.
7" minimum diameter handwheel for simplified hand closing	✓			

COOPER ALLOY
THE COOPER ALLOY FOUNDRY CO.
2802 TENTH ST • BERKELEY 2, CALIF.

Please send along my free copy of your detailed chart comparing competitive 2" stainless steel gate valves.

Name _____
Position _____
Company _____
Address _____
City _____ Zone _____ State _____

One of the several reasons why it is such an effortless pleasure to adjust a National regulator tension screw to any desired delivery pressure setting is the nylon bearing. Of course, another important reason is the fully sealed tension screw bearing section which permits neither dust nor grit to enter; it assures sealed in smoothness. . . .

Why not try out a National regulator, single or two stage reduction, it's worth your while, we assure you.

Write for the fascinating story on regulators. 44 fact packed pages of interest.

Made by National SINCE 1910 **WELDING EQUIPMENT CO.,** San Francisco 5, California

850

GET THIS NEW BUDA FACTS BOOK NOW!

Here is a gold mine of information for everyone concerned with efficient materials handling at the lowest possible cost! 36 pages of vital information about the most functionally designed fork lift trucks. Facts and figures that serve as standards of comparison. Data that means faster, less costly materials handling in your plant.

It shows how BUDA easily maneuvers in tight corners, lifting and placing cargo with a feather touch . . . how BUDA strips to the frame in 22 minutes, saving hours of down-time . . . how the BUDA clutch is pulled in only 30 minutes . . . how BUDA Diesel and gasoline engines out-work other engines by thousands of hours . . . how BUDA trucks are on the line all the time!

See that your Materials Handling Men get this profitable, new data book by writing today to:

BUDA

THE BUDA COMPANY
Harvey, Illinois

The Line With ALL 3 For Diversified Handling.

Chore Boys

Industrial Tractors

Fork Lift Trucks

Diesel and Gasoline Engines, Lifting Jacks, Railroad Equipment, Earth Drills, Materials Handling Equipment

Your Western DELTA Dealer Stocks DELTA Radial Saws...DELTA Tilting Arbor Circular Saws...And All Other DELTA Woodworking and Metalworking Machines

ASK HIM TO SHOW YOU HOW DELTA SAWS CAN CUT COSTS IN YOUR PLANT OPERATIONS

• BURBANK, CALIFORNIA
ATWOOD MACHINERY COMPANY
Burbank, California
Phone: ROckwell 9-3774

• LONG BEACH, CALIFORNIA
ATWOOD MACHINERY COMPANY
Long Beach, California
Phone: Long Beach 4-3504

• LOS ANGELES, CALIFORNIA
ANDREWS HARDWARE AND METAL COMPANY
Los Angeles 13, California
Phone: MUtual 6111

HARRON, RICKARD, AND McCONE COMPANY OF SOUTHERN CALIFORNIA
Los Angeles, California
Phone: LOgan 5-8361

HOFFMAN AND HEARTT
Los Angeles 7, California
Phone: RIchmond 5371

ZONNE ELECTRIC TOOL COMPANY
Los Angeles 11, California
Phone: RIchmond 7-0561

• OAKLAND, CALIFORNIA
DELTA EQUIPMENT AGENCY
Oakland 12, California
Phone: TEmplebar 2-6878

C. W. MARWEDEL
Oakland, California
Phone: TEmplebar 2-3800

THE MERRILL-BROSE COMPANY
Oakland, California
Phone: TEmplebar 2-4873

• PALO ALTO, CALIFORNIA
MERNER LUMBER AND HARDWARE COMPANY
Palo Alto, California
Phone: DAvenport 3-5131

• SACRAMENTO, CALIFORNIA
MURRAY MACHINERY AND SUPPLY
Sacramento, California
Phone: GIlbert 3-1985

• SAN DIEGO, CALIFORNIA
THE CRAFT SHOP
San Diego, California
Phone: FRanklin 6174

• SAN FRANCISCO, CALIFORNIA
C. F. BULOTTI MACHINERY COMPANY
San Francisco 7, California
Phone: SUtter 1-1006

COAST EQUIPMENT COMPANY
San Francisco 1, California
Phone: MArket 1-5740

C. W. MARWEDEL
San Francisco, California
Phone: UNderhill 1-2125

• SAN JOSE, CALIFORNIA
SAN JOSE HARDWARE COMPANY
San Jose, California
Phone: CYpress 5-8454

• STOCKTON, CALIFORNIA
HICKINBOTHAM BROS., LTD.
Stockton, California
Phone: 9-9541

• WALLACE, IDAHO
COEUR D'ALENE HARDWARE & FOUNDRY CO.
Wallace, Idaho
Phone: 1151

• BILLINGS, MONTANA
THE STROUP HARDWARE COMPANY
Billings, Montana
Phone: 33186

• PORTLAND, OREGON
SCHNITZER AND WOLF MACHINERY CO.
Portland, Oregon
Phone: ATwater 7501

• SEATTLE, WASHINGTON
STAR MACHINERY COMPANY
Seattle, Washington
Phone: ELiot 0760

• TACOMA, WASHINGTON
WEBSTER ROBINSON MACHINERY AND SUPPLY COMPANY
Tacoma, Washington
Phone: BRoadway 0341

Which Of These Cost-Cutting DELTA Circular Saws Should You Buy?

Hundreds of manufacturers, on the alert to cut costs and eliminate bottlenecks in their shipping rooms, maintenance departments and pattern shops, have realized astonishing savings with low cost, semi-portable DELTA radial or tilting arbor saws . . . used either alone or in combination.

Both are highly versatile, but each does one job best. If your wood cutting operations are predominantly cross-cutting, you'll want the advantages of the radial saw, where the blade moves rather than the material. This minimizes time-wasting handling, and operator fatigue.

On the other hand, for ripping operations, your tilting arbor saw is without parallel. The operator stands in a natural ripping position, allowing greater production.

DELTA RADIAL SAW

Easy "pull-saw" action makes cross-cutting fast, easy and accurate. And, with DELTA'S exclusive 360° arm swing, you can make any cut . . . at any angle . . . without moving the board. DELTA radial saws are the most versatile . . . most accurate ever designed. For rugged dependability, utmost safety, and easy operation, they cannot be equalled. DELTA radial saws are available in 8", 10", 12", 14" and 16" models, and from ½ hp to 7½ hp.

DELTA TILTING ARBOR SAW

The ideal ripping machine, the DELTA tilting arbor saw, lends itself to low cost, high production precision ripping. No saw on the market at a price anywhere near comparable has as many outstanding built-in advantages of construction and performance, yet it's a real "variety saw" and serves as a perfect all-around unit in any shop. DELTA tilting arbor circular saws are available in 8", 10" and 12" models.

With DELTA radial and tilting arbor saws working side by side, many manufacturers are not only eliminating bottlenecks in operations requiring wood-cutting, but they're saving money in the process. Why not adopt their methods to your plant. Your DELTA dealer can show you how to do it. For full information, consult your Delta Dealer, or write Delta Power Tool Division, Rockwell Manufacturing Company, 400 North Lexington Avenue, Pittsburgh 8, Pa.

DELTA QUALITY POWER TOOLS
Another Product of **Rockwell**

ROCKWELL

DELTA QUALITY MAKES THE DIFFERENCE

DELTA MILWAUKEE

A G-E PACIFIC GEAR-MOTOR DRIVES THIS STEAMING GREASE COLLECTOR 8 HOURS A DAY AT PETERSON CO., LOS ANGELES

"In Eight Years—No Trouble with our G-E Pacific Gear-motor"

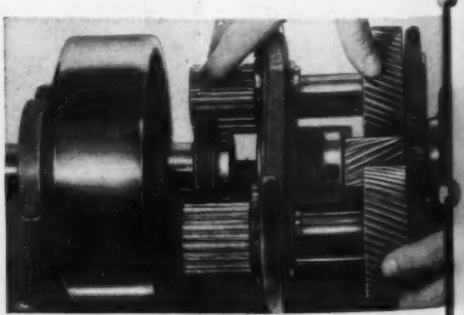
. . . reports the Peterson Manufacturing Co. of Los Angeles, makers of grease and tallow products, about the G-E Pacific Gear-motor it chose in 1945.

"Our G-E Pacific Gear-motor has been driving a grease collector every day for the past 8 years. Though it has operated constantly in an atmosphere of hot grease and steam, it's never given us any trouble at all. For our money the G-E Pacific Gear-motor is the toughest low-speed drive on the market."

Order your G-E Pacific Gear-motor through your nearest G-E Apparatus Sales Office or your Authorized Agent or Distributor. For printed information, write to General Electric Co., Section 756-5, Schenectady 5, N. Y., for a free copy of Bulletin GEA-5787.

SIMPLE MAINTENANCE—Handy dip-stick tells you when oil in transmission needs refilling—the only maintenance that's needed.

EASY INSTALLATION—Simple, compact design makes the G-E Pacific Gear-motor as easy to install as any general-purpose motor.

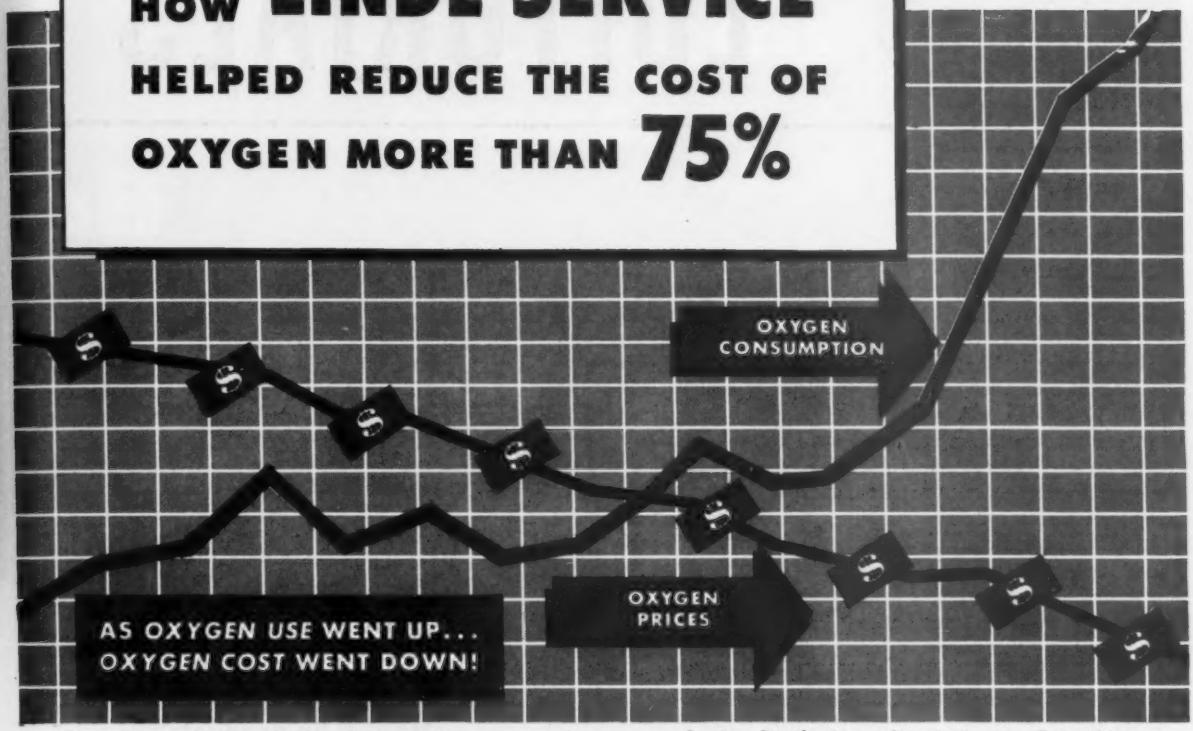


LONGER LIFE—Wear on gears is greatly reduced by dual countershaft drive which divides the load at the high speed pinion.

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

GENERAL ELECTRIC

HOW LINDE SERVICE* HELPED REDUCE THE COST OF OXYGEN MORE THAN 75%



LINDE SERVICE has brought about important improvements in oxygen production, distribution, and methods of use. In profiting by these improvements, LINDE customers have increased their use of oxygen per ingot-ton of steel produced more than 12 times in 25 years. This increased volume of usage in turn enabled LINDE to reduce the cost of oxygen more than 75% in that time.

With LINDE Oxygen you get *all* these important advantages—

- **DEPENDABILITY OF SUPPLY** —— No oxygen shortage due to failure of a single plant. Many strategically located plants to meet every demand.
- **FLEXIBILITY OF SUPPLY** —— No fixed capacities. You get what you need when you need it . . . and pay only for what you use.
- **LOW UTILIZATION COST** —— No capital investment . . . no costly maintenance.

*PLUS . . .** LINDE SERVICE—

The unique combination of research, engineering, and over 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

If your company uses oxygen. LINDE SERVICE *can mean dollar savings to you. Let us tell you more about it.*

LINDE AIR PRODUCTS COMPANY

A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC New York 17, N. Y.

Offices in Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

Western Industry

EDITORIALS

While Management Dreams

IT SEEMS as though management could well take more interest in apprenticeship training than it now appears to be showing.

The recent First North American Conference on Apprenticeship Training at San Diego was a good example of how laggard employers are on a subject of equal importance to them, if not greater than, unions, schools and government bureaus. Management was greatly under-represented in numbers, although it must be said that the management representatives who were on hand gave an excellent account of themselves.

Top management was on hand to the extent of probably half a dozen; there was a somewhat larger number of training supervisors, industrial relations directors, personnel managers and bargaining organization managers. But all in all, it seemed to be the same old story of letting other groups dominate the scene. If apprenticeship conferences, training programs and legal requirements take an undesirable trend, management can blame no one else.

While top management may feel that here is one more base than they can cover personally, it is no excuse for not insuring as good a turnout of their representatives as is to be found at personnel management and industrial relations conferences.

Fears that apprentice training programs are the entering wedge for additional union restrictions do not seem to be borne out by the experience of those employers who actually participate. Even if it were so, it is entirely possible that the advantages outweigh the disadvantages. As for the fear that you are training an apprentice for someone else to hire as a journeyman, that belongs to the horse-and-buggy days.

Finally, an apprenticeship conference provides an opportunity for management and labor to meet on common ground, and that opportunity should be cultivated to the utmost.

Stand By for Protection

IT IS A rather startling thing to contemplate that at the outbreak of hostilities in Korea three years ago, the Norris-Thermador plant at Vernon, California, represented practically all of the commercial production capacity for cartridge case production in the country. It is a reminder that Pearl Harbor found at least one small bay on the Pacific Coast defended to the extent of a motor boat and a shotgun.

Fortunately the situation appears likely to be remedied in that the Riverbank (California) Ordnance Plant, the world's largest cartridge case plant, which opened only nine months ago, is to be kept on a standby basis, if the recommendations of the Army Ordnance Association are carried out. The Coast has two other big ordnance facilities, Food Machinery's ordnance plant at San Jose, and Pacific Car & Foundry at Renton, Washington.

The cost of continuing these facilities is trifling, in view of today's disturbed world conditions. A good many American lives can be saved thereby.

Mental By-products

THE BY-PRODUCTS are often more important than the main item itself. We almost feel inclined to say that about General Foods. While we have no fault to find with the material products they dispense, we venture to say that the food for thought provided by Tom Spates, their vice president for personnel administration, will endure long after the coffee, breakfast foods and other eatables have been forgotten.

Speaking at the Stanford Business Conference in July, he said: "It is not enough for the directors and officers of our industrial and commercial enterprises to make only a financial success of their businesses. They should be not only willing, but determined, to eliminate from the work environment the disillusionments and frustrations that cause employees at all levels of organization, including management, to lose faith in the acclaimed virtues of the American business system and welcome the anesthetic effects of Government paternalism and control."

acids

air

grease

oil

acetylene

water

butane

propane

gasoline

Thermoid
Industrial Rubber Products
Quality Value Service

One hose handles them all!

VERSICON, Thermoid's versatile, all-purpose hose, handles virtually any type of gas or liquid . . . makes stocks of many different types of hose unnecessary. You save through reduced inventories, simplified buying and less storage space. Losses from end remnants are greatly reduced.

VERSICON Hose is built to last. Synthetic oil-proof tube is reinforced with braided, high-tensile rayon. Tough oil-proof cover resists weather and abrasion.

For quick, easy identification, VERSICON has a brown cover. It's available in sizes from 3/16" to 1½" in lengths to fit your requirements.

In addition to various kinds of multi-purpose hose, Thermoid makes hose for certain specific applications, such as paint spray, suction, creamery, etc. Call your Thermoid Distributor. He can supply you with the Thermoid Hose best suited for your requirements. Or write direct for Catalog No. 3680.

Thermoid Western Co.

Conveyor & Elevator Belting • Transmission Belting • F.H.P. & Multiple V-Belts
Wrapped & Molded Hose • Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Offices and Factories: Trenton, N.J. Nephi, Utah

PLEXOLITE
For Glare-Free Light

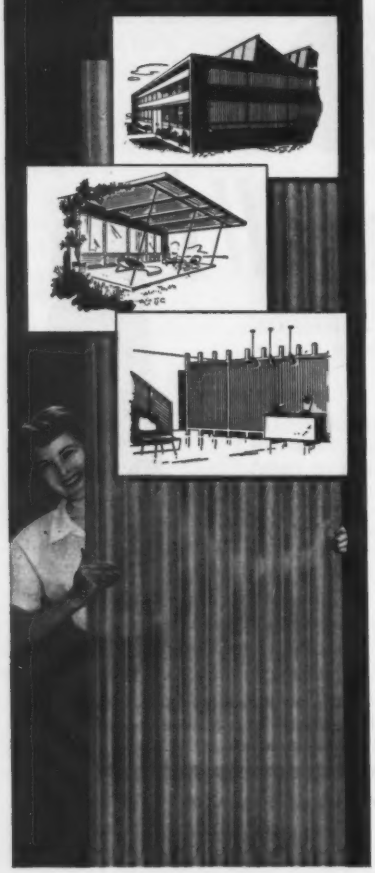
This modern translucent material with unlimited applications transmits soft, diffused light. PLEXOLITE is available in 12 colors, 27 standard sizes, in corrugated or flat panels. Shatterproof PLEXOLITE nests with all corrugated materials. Economical – only light framing necessary. PLEXOLITE is sawed, drilled or nailed with ordinary tools. Lightweight, strong and everlasting under all weather conditions.

NEW LOW PRICES

Write for information or name of nearest dealer

General Distributor
PLEXOLITE SALES CO.
4223 W. Jefferson • Los Angeles 16
REpublic 0253

*PLEXOLITE is a Fiberglas reinforced, polyester resin material manufactured by the PLEXOLITE Corp. of California.



LETTERS

Contributions to this column from our readers are welcome. Names will be withheld from publication if so requested. Unsigned letters, however, will be disregarded.

He wants motors

Editor, *Western Industry:*

I am an ardent reader of *Western Industry*. Keep up the good work.

At present I am trying to locate a reliable source of small shaded pole, reversible, constant speed, 115-volt electric motors with a series of speed reduction gears to approximately 8 rpm.

These units will be subjected to varying low voltage conditions and it is desirable that they maintain very near a constant speed at all voltages. They will be used for only short periods of time; not over eight minutes three or four times per twenty-four hour day.

We will need several thousand of these units as fast as delivery can be made.

If you know of, or can locate, a source of these units, please have them contact us or we will contact them. We will then go into more specific engineering and service details.

We will appreciate any assistance you may be able to render in this matter.

W. D. Hussey
Superior Pump & Sprinkler Service
7153 Hussey Drive,
Carmichael, Calif.

Nutcrackers

Editor, *Western Industry:*

We confirm our interchange of telegrams as per the enclosed and appreciate your promptness in replying to the effect that the nut cracking equipment described in your issue of May 1953 is the property of the Northwest Nut Growers.

For your information, the article in your magazine was seen by one of our friends in France and he asked us for the information that we requested. We are sure that you will be interested in this evidence of the wide circulation of your publication.

Incidentally we are interested in walnut shelling equipment and if you could give us any assistance along that line we would greatly appreciate it.

S. Simons
Simons & Co., Importers-Exporters
Boston, Mass.

Water problem

Editor, *Western Industry:*

Somehow your 16 February 1953 transmittal letter accompanying twenty sets of tear sheets of the Riegel article on "Stretching the Water Supply" from your November 1952 issue found its way into our file without acknowledgment.

We feel your publication has done much good in spotlighting the water problem for Western industrial water users. Please keep us in mind as time goes on and let us know if we may be of help to you in keeping the water problem in the minds of those individuals upon whose shoulders falls the conservation of our greatest natural resource.

Raymond C. Kelly
Executive Manager,
Cooling Tower Institute,
Palo Alto, Calif.

Training supervisors

Editor, *Western Industry:*

Today we opened the latest issue of *Western Industry* and were very pleased with the lead story [July 1953, "Supervisors Go for Training on Their Own Time," based on experience of Ryan Aeronautical Co.].

You have done a fine job in reproducing and interpreting the facts of this story to your readers and we are pleased to note the enthusiastic comments which we are getting here as a result of the circulation of issues of this magazine.

William P. Brotherton
Public Relations, Ryan Aeronautical Co.,
San Diego.

Need Western info

Editor, *Western Industry:*

Your publication is excellent. I receive four others and find yours to be superior, and I like a *Western* publication.

George M. Paine
Consulting Engineer,
Los Altos, Calif.

Tearsheet stuff

Editor, *Western Industry:*

Attached, we are returning to you, with our many thanks, the tearsheets of the first installment of the Ghormley articles as requested in your letter of February 6.

These articles have been very interesting and educational, and we appreciate very much the courtesy extended to us.

C. J. Coleman
Manufacturing Manager
The Flintkote Company
Folding and Set-Up Box Division
Los Angeles

MPB miniature ball bearings offer a ready solution to many difficult miniaturization projects involving space, weight and friction.

RADIAL SERIES

BEARING NUMBER	O.D.	BORE	WIDTH
100	.1000"	.0250"	.0312"
2	.1250"	.0400"	.0469"
2½	.15625"	.0469"	.0625"
3	.1875"	.0550"	.0781"
▼4	.2500"	.0781"	.0938"
▼5	.3125"	.09375"	.1094"

PIVOT SERIES

1½ P	.0590"	.020"†	.0472"
3 P	.1181"	.030"†	.0709"
4 P	.1575"	.040"†	.0945"
▼5 P	.1968"	.050"†	.1181"
▼7½ P	.2953"	.075"†	.1772"
▼10 P	.3937"	.100"†	.2362"

SUPER-LIGHT RADIAL SERIES

418	.2500"	.1250"	.0938"
▼518	.3125"	.1250"	.1094"
5532	.3125"	.15625"	.1094"
5632	.3125"	.1875"	.1094"
5732	.3125"	.21875"	.1094"
614	.3750"	.2500"	.1250"

GROOVED RADIAL SERIES *(Full Race or Retainer Type)*

3 G	3 GC	.2188"	.0550"	.0781"
4 G	4 GC	.2812"	.0781"	.0938"
5 G	5 GC	.3438"	.09375"	.1094"
518 G	518 GC	.3438"	.1250"	.1094"
5532 G	5532 GC	.3438"	.15625"	.1094"
5632 G	5632 GC	.3438"	.1875"	.1094"

FLANGED RADIAL SERIES *(Full Race or Retainer Type)*

2½ F	2½ FC	.15625"	.0469"	.0625"
3 F	3 FC	.1875"	.0550"	.0781"
4 F	4 FC	.2500"	.0781"	.0938"
5 F	5 FC	.3125"	.09375"	.1094"
418 F	418 FC	.2500"	.1250"	.0938"
518 F	518 FC	.3125"	.1250"	.1094"
5532 F	5532 FC	.3125"	.15625"	.1094"
5632 F	5632 FC	.3125"	.1875"	.1094"

RADIAL RETAINER SERIES

2½ C	.15625"	.0469"	.0625"
3 C	.1875"	.0550"	.0781"
4 C	.2500"	.0781"	.0938"
5 C	.3125"	.09375"	.1094"
418 C	.2500"	.1250"	.0938"
518 C	.3125"	.1250"	.1094"
5532 C	.3125"	.15625"	.1094"
5632 C	.3125"	.1875"	.1094"

ANGULAR CONTACT SERIES

2 A	.1250"	.042†	.0469"
3 A	.1875"	.062†	.0700"
▼4 A	.2500"	.085†	.0938"
▼6 A	.3750"	.124†	.1406"
6 A7B	.3750"	.150†	.1406"

THRUST SERIES

2 T	.1250"‡	.0400"§	.0625"
4 T	.2500"‡	.0938"§	.0938"
5 T	.3125"‡	.1250"§	.1250"
6 T	.3750"‡	.1875"§	.1500"
7 T	.4375"‡	.1250"§	.1875"

SPRING SEPARATOR SERIES

5 S	.3125"	.09375"	.1094"
518 S	.3125"	.1250"	.1094"
5532 S	.3125"	.15625"	.1094"
5632 S	.3125"	.1875"	.1094"

SEPARABLE SERIES

3 M	.1875"	.0550"	.0781"
4 M	.2500"	.0781"	.0938"
5 M	.3125"	.09375"	.1094"
518 M	.3125"	.1250"	.1094"

Prefixes indicate material: Standard is chrome bearing steel (SAE 52100): use no prefix. All bearings also available in 440 stainless, except #100 and #1½P. Use prefix "SS" in ordering stainless. ▼Indicates also available in 25 beryllium. Order with prefix "NM". Suffixes indicate type of bearing: F—flange, G—groove, M—separable, C—radial retainer, S—spring separator, T—thrust, P—pivot, A—angular contact, FC—flanged with retainer, GC—grooved with retainer. Complete load ratings are given in catalog. †Shaft (S) min.; ‡ O.D. clearance of opposite race .002"; §Bore clearance of opposite race .002".

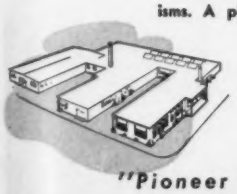
MPB ball bearings

are available in ten design series and in more than 140 different types and sizes which normally can be supplied from stock for prompt installation.

Instrument manufacturers and users of small precision mechanisms can now utilize all the well known extra advantages of anti-friction bearings (accurate alignment, long wear, freedom from attention) universally accepted in larger quality equipment.

For more than 20 years **MPB** ball bearings have contributed to the successful operation of precision mechanisms. A pioneer in designs and dimensions now being internationally standardized, **MPB** has also originated many precision manufacturing techniques. All **MPB** ball bearings are ground, lapped, honed and/or burnished in accordance with highest quality practice for optimum operating characteristics. Inspection limit tolerances are equal to ABEC 5 or better.

The most extensive engineering knowledge in miniature bearing applications is available to you. More than a million **MPB** ball bearings have been installed in precision mechanisms. Catalog 53 giving complete specifications, and additional data sheets mailed to you on request.



Miniature *Precision* Bearings

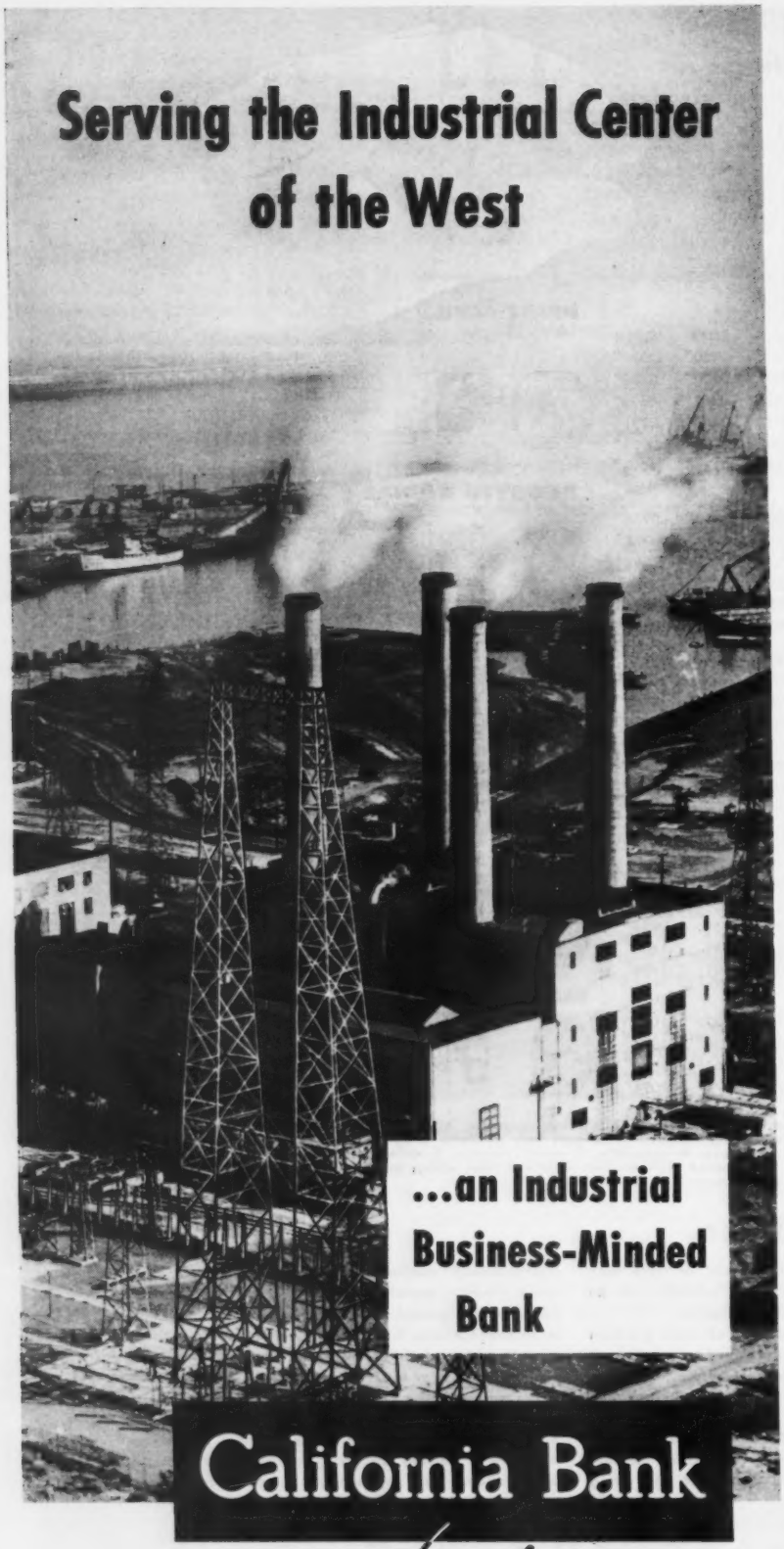
Incorporated Keene, New Hampshire

"Pioneer Precisionists to the World's Foremost Instrument Manufacturers"

save space weight friction

PACIFIC AREA REPRESENTATIVES:

Los Angeles, Edward D. Maltby Co., Inc., 1718 South Flower St.
San Diego, Edward D. Maltby Co., Inc., 745 - 15th St.
Phoenix, Edward D. Maltby Co., Inc., 120 S. 4th Avenue
Honolulu, Edward D. Maltby Co., Inc., 1358 Kapiolani Blvd.



MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

THIS MONTH'S COVER

ATOMIC ENERGY— electric power source

THE WEST has come up with another first on atomic energy. The National Reactor Testing Station at Idaho Falls, Idaho, is making electrical power from atomic energy.

An experimental breeder reactor operated by Argonne National Laboratory provides the energy to run a unique steam generator, which in turn generates electricity. The steam generator is designed to prevent mixing of the reactor's alkali metal coolant and water which, in contact, react violently.

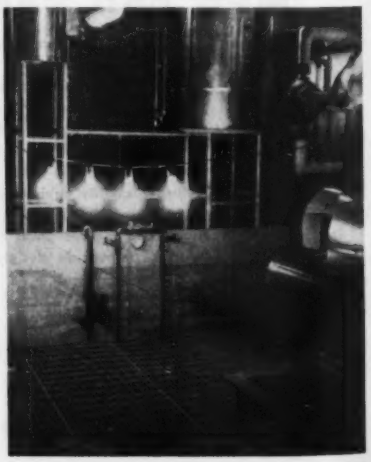
Steam goes to a superheater and emerges at 550 deg. F. and 400 psi.

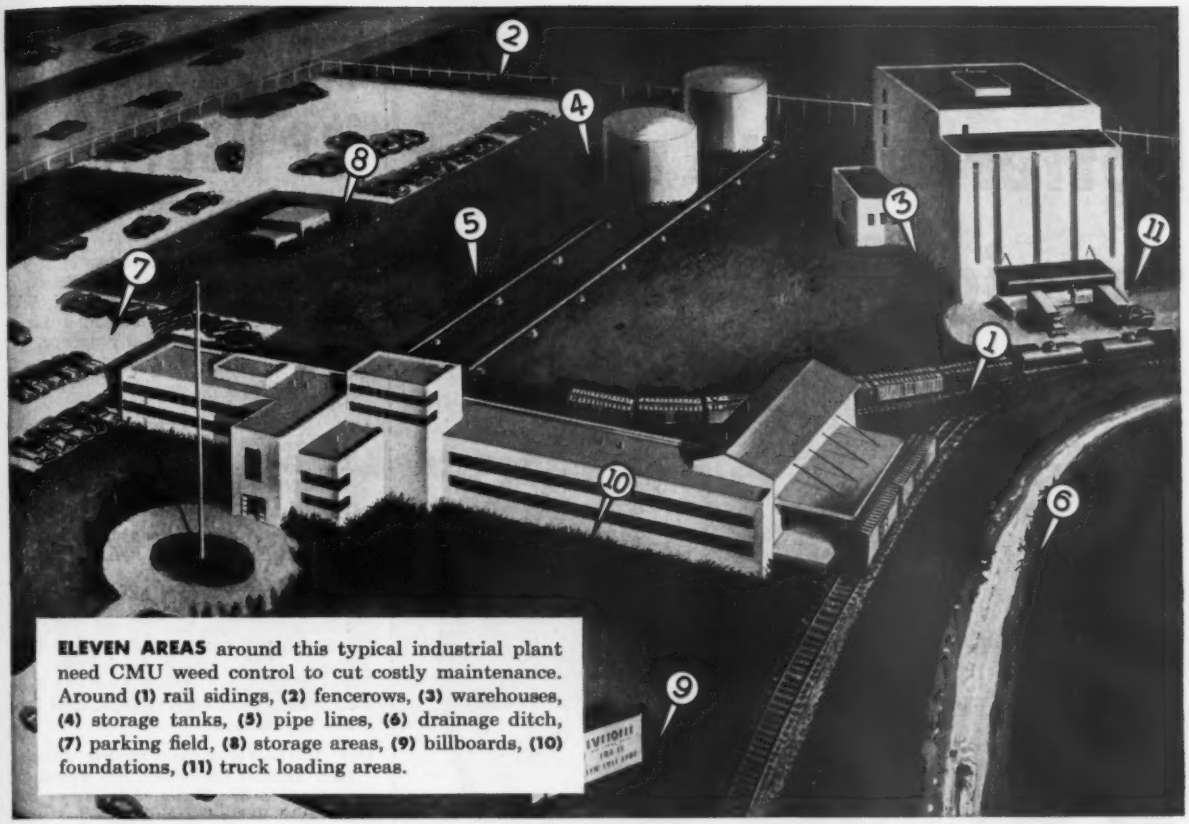
From here it is piped through a turbogenerator that produces the 170 kw. needed by the reactor, additional equipment and building.

With this equipment, the experimental breeder reactor produced the first usable electricity from atomic energy in December 1951.

The U. S. Atomic Energy Commission recently announced that the primary goal of the reactor has been achieved. The breeder reactor is designed to produce plutonium by bombarding uranium 235. Production of plutonium from U-235 is now at least equal to the rate at which the uranium, the reactor's fuel, is consumed.

THESE FOUR electric light bulbs show the first known use of electricity from atomic energy. The bulbs were lighted from the generator at right, which is powered by heat from the experimental breeder reactor at Idaho Falls, Idaho.





ELEVEN AREAS around this typical industrial plant need CMU weed control to cut costly maintenance. Around **(1)** rail sidings, **(2)** fencerows, **(3)** warehouses, **(4)** storage tanks, **(5)** pipe lines, **(6)** drainage ditch, **(7)** parking field, **(8)** storage areas, **(9)** billboards, **(10)** foundations, **(11)** truck loading areas.

Where you don't want vegetation . . .

Du Pont CMU kills grass and weeds and also prevents regrowth

Save labor and avoid many fire hazards by getting rid of the weed and grass nuisance around your plant with Du Pont CMU. As little as 1 to 1½ pounds per 1000 square feet . . . 40 to 60 pounds per acre . . . can keep down weeds and grass for an entire growing season or longer. CMU gives you new efficiency in weed control.

- Not only kills weeds and grass but also prevents regrowth. It works through the roots . . . just spray it on the ground.
- Reduces fire hazards caused by unwanted vegetation.
- Saves work. One easy spray replaces laborious hand cutting, mowing, spreading bulky chemicals or repeated weed sprays.
- Cuts maintenance and depreciation. Keeps the way clear for outdoor work or storage. Destroys cover for rats and vermin.
- Non-flammable, non-volatile, non-corrosive. Comes as a wettable powder ready to mix with water.

TO GET THIS BOOKLET SHOWING RESULTS WITH CMU, *fill in coupon at right.*

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.) O-9
Grasselli Chemicals Department
111 Sutter Street, San Francisco, Calif.

Please send me illustrated booklet and other information about CMU.

Name_____

Firm_____

Street_____

City_____ State_____

There's a better way to choose the right cutting oil!

You can't choose the right cutting oil by spinning a wheel. But with the help of your Richfield representative you may be able to choose *one oil* that will serve for *all* the cutting operations in your plant.
Call Richfield today—save time—save money—speed production.

If it's RICHFIELD it's Right—
because RICHFIELD is Years-Ahead!

RICHFIELD®

RICHFIELD OIL CORPORATION

CALENDAR OF MEETINGS

SEPT. 23-25—*National Association of Motor Bus Operators* conference at Fairmont Hotel, San Francisco. Contact F. W. Ackerman, pres., Pacific Greyhound Lines, Pine and Battery Sts., San Francisco.

OCT. 11—*Western States Council*, annual meeting, Salt Lake City.

OCT. 11-12—*Vertical Turbine Pump Manufacturers*, fall meeting, Broadmoor Hotel, Colorado Springs, Colo. Contact B. A. Tucker, secretary, 301 W. Avenue 26, Los Angeles 31.

OCT. 14-16—*National Reclamation Association*, annual convention, Reno, Nevada.

OCT. 16—Professional divisions Annual Conference, *San Francisco sec., ASME*, "Contributions of Western Engineers to the Development of the Industrial West." University of California Extension div., 540 Powell St., San Francisco. Contact: Hans Altorfer, Nordstrom Valve Co., 2431 Peralta St., Oakland.

OCT. 16-17—*Automotive Electric Association*, national conference, San Francisco. Contact S. W Potter, exec. secy., 802 Michigan Bldg., Detroit 26, Mich.

OCT. 20-22—*Pacific Coast Management Conference*, at the Claremont Hotel, Berkeley, Calif. For further information contact California Personnel Management Assn., 2180 Milvia St., Berkeley 4.

OCT. 22-23—*American Ceramic Society*, Western regional conference at Palace Hotel, San Francisco. Contact James Hicks, chairman, at Kaiser Aluminum & Chemical Co., Rt. 6, Box 290, San Jose, Calif.

OCT. 27-30—*California Section, American Water-Works Association*, state convention, San Francisco. Contact John C. Luthin, secy.-treas., 1113 Laurent St., Santa Cruz, Calif.

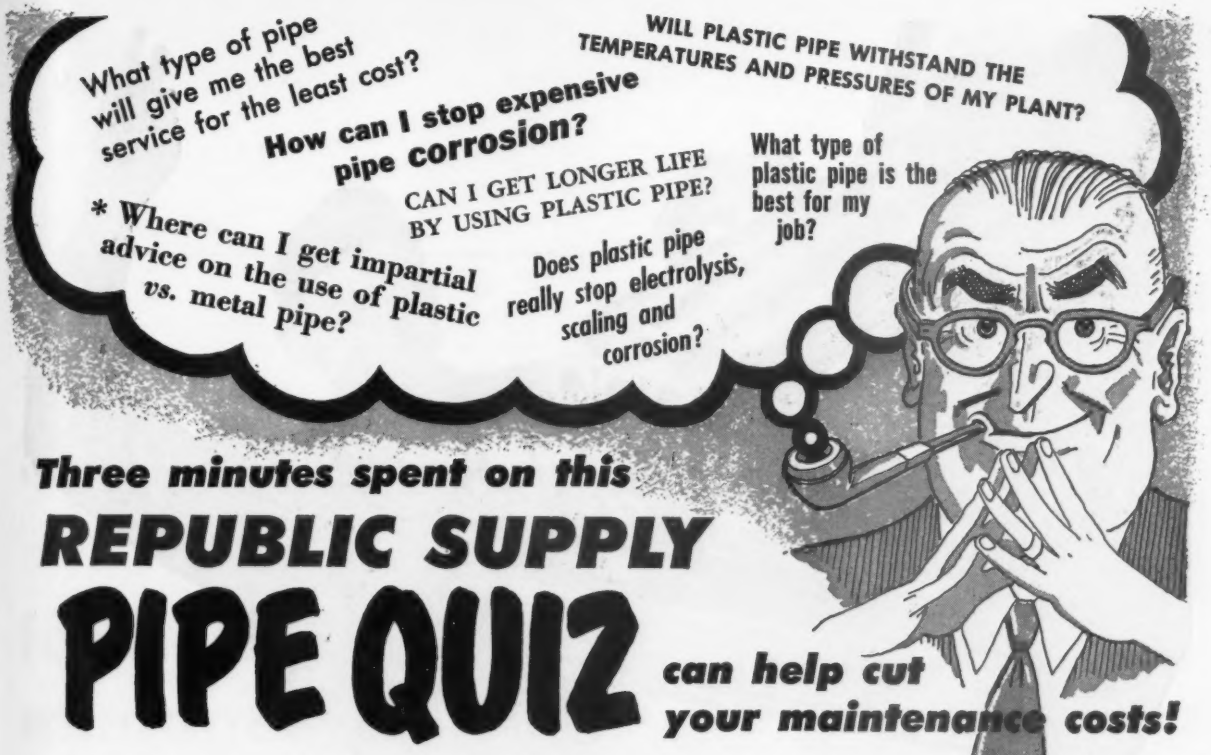
OCT. 28-31—*International Mining Days* and *New Mexico Mining Association* collaborate with AIME's regional fall meeting, El Paso, Texas. Contact Ben D. Roberts, 310 San Francisco St., El Paso.

NOV. 1-3—*Pacific Northwest Trade Assn.* Fall conference on water resource development, Hotel Davenport, Spokane. Contact D. C. Knapp, executive secretary, 1217 Joseph Vance Bldg., Seattle.

NOV. 6-8—*Furniture Mfrs. Assn. of Southern California*. At El Mirador Hotel, Palm Springs.. Contact Edward S. Feldman, exec. sec., 2155 E. 7th St., Los Angeles.

NOV. 9-10—*California Fertilizer Association*, annual convention, business sessions at Golden Bough Theatre, Carmel, and Monterey Peninsula Country Club. Headquarters hotel for session, Hotel LaPlaya, Carmel, Calif. Contact secy.

NOV. 11-13—*Association of Food Industry Sanitarians* annual business meeting and conference at Claremont Hotel, Berkeley. Contact P. E. Laughlin, program committee chairman, 1 Drumm St., San Francisco.


What type of pipe will give me the best service for the least cost?
How can I stop expensive pipe corrosion?
WILL PLASTIC PIPE WITHSTAND THE TEMPERATURES AND PRESSURES OF MY PLANT?
CAN I GET LONGER LIFE BY USING PLASTIC PIPE?
What type of plastic pipe is the best for my job?
* Where can I get impartial advice on the use of plastic vs. metal pipe?
Does plastic pipe really stop electrolysis, scaling and corrosion?

Three minutes spent on this

REPUBLIC SUPPLY PIPE QUIZ

can help cut your maintenance costs!

If you'll take just three minutes to check these important points, you may discover a better, less expensive way to solve your own piping problems. It is to your advantage to keep informed regarding the latest improvements in piping materials.

✓ **WHAT NEW TYPE OF PIPE MAY HANDLE YOUR JOB BETTER?** If you are not getting maximum trouble-free life from the pipe you are presently using, or if you are using expensive materials like lead, brass or stainless steel, you should investigate plastic pipe—it may save you money, and it's highly possible that plastic will *outlive* and *outperform* your present piping! Here's a simple formula for selecting the right piping material for your job:

$$\frac{\text{COST OF PIPE} + \text{INSTALLATION COST} + \text{MAINTENANCE COSTS}}{\text{LONGEVITY (YEARS OF LIFE)}} = \text{VALUE}$$

✓ **WHY SHOULD I CONSIDER USING PLASTIC PIPE?** In the right application, plastic pipe can outperform any other pipe many times. You should consider the use of plastic pipe when: (1) corrosion (including electrolysis) is a problem; (2) plastic is less expensive than the piping materials presently being used; (3) you have scaling or wall caking; (4) ease of installing plastic pipe will result in worth-while savings; (5) light weight or flexibility is desired; (6) a higher flow factor is wanted (15-40% greater than steel).

✓ **CAN I STOP EXPENSIVE PIPE CORROSION?** Scaling and pipe corrosion from any cause such as corrosive line fluids, electrolysis, soil condition, atmospheric conditions, tuberculation, etc. can be minimized and often stopped completely by using plastic pipe. If you haven't looked into plastic for corrosive applications, you may be wasting thousands of dollars each year in shortened pipe life!

✓ **CAN PLASTIC PIPES TAKE MY PRESSURES AND TEMPERATURES?** Unless you've evaluated your piping recently, and investigated the many new materials available, you may not be getting the maximum value from your present piping investment. Six basic types of plastic pipe now available provide a wide range of temperature and pressure applications. Working temperatures up to 230°F. and safe working pressures up to 300 psi are now possible with plastic pipe. Republic will help you determine the *one best* pipe for your particular job—whether it's plastic or metal.

✓ ***HOW TO GET IMPARTIAL ADVICE ON THE BEST PIPE FOR YOUR JOB.**

Because Republic Supply handles all six basic types of plastic pipe—plus all types of metal piping, Republic is the *only* source able to give you impartial comparison of piping materials. Republic can recommend the *one best* type or kind of pipe for your particular piping problem, whether metal or plastic, and furnish it immediately from their complete warehouse stocks.

LET REPUBLIC SUPPLY YOUR NEEDS!

pipe, valves and fittings • abrasives • shop supplies and tools • rigging materials • mechanical rubber goods • machinery • oil field supplies

REPUBLIC SUPPLY COMPANY OF CALIFORNIA

Main Offices: Los Angeles, 2600 South Eastland Avenue
San Leandro, 1919 Williams Street

An independently owned and operated company serving Western Industry

☐ Please send special report showing comparative features, properties and prices of all types of plastic pipe.

☐ Please furnish free samples of plastic pipe.

☐ Poly Vinyl Chloride ☐ Tenite (Butyrate)
☐ Polyethylene ☐ Styrene Copolymer (Uscolite)
☐ Fiberglas ☐ Saran

☐ Please contact me regarding additional specific information on plastic piping.

Name.....

Firm.....

Address.....

City.....Zone.....State.....

Coming Up!

Steel for Western Industries

You can always be sure of fast action when you call Ryerson for steel. Sure that your requirements will get prompt, interested attention.

At each of 15 strategically located Ryerson plants experienced steel men who know the special needs of your industry are ready to work with you. And at Ryerson you draw on the most widely diversified stocks. Carbon steel, alloys, stainless—though it's still difficult to keep every size of every product always on hand, you will find we can take care of most every steel requirement.

You can have your steel cut to size, too, and you can always depend on Ryerson quality.

So for every steel requirement, call your nearby Ryerson plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel

STAINLESS—Stainless bars, plates, sheets, tubes, etc.

BABBITT—Five types, also Ryertex plastic bearings

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC.

LOS ANGELES—Plant: 4310 E. Bandini Blvd. Mail: Box 3817, Los Angeles 54. Phones: Angelus 2-6141, from San Diego (no toll), Zenith 6660.
SAN FRANCISCO—Plant: 65th & Hollis Sts., Emeryville. Mail: Box 188, Emeryville, California. Phones: Olympic 3-2933, Enterprise 1-0176.
SEATTLE—Plant: 1200 - 4th Ave. Mail: Box 3268, Seattle 14. Phone: Seneca 2300.
SPOKANE—Plant: North 207 Freya St. Mail: Box 2158, Spokane 10. Phone: Keystone 9311.

Western Industry

SEPTEMBER 1953

"TEAM" WORK PAYS OFF—

for both management and employees

PRODUCTION "triumvirate" holds a planning session in the conference room. Left to right: Methods Engineer William Beardsley, Production Superintendent King Handley, and General Assembly Foreman Gerry Kibler.

A CLOSELY coordinated "team" system has been organized at the electronics division of Iron Fireman Manufacturing Co., Portland, Ore., to create a year-round level of employment and increase employee earning capacity. This unique utilization of manpower not only benefits employees but has considerably increased plant efficiency.

This "team" system is specifically tailored to this particular operation; however, its fundamentals can be put to work almost anywhere.

Numerous parts and products

Iron Fireman division produces 159 different products, involving some 4,500 different parts. There are in excess of 800 sub-assembly operations alone, plus an undeterminable number of machine shop, final assembly and testing operations. The plant employs 280 people, of whom 150 are women.

Simply, here is the physical set-up of the "team" system. It centers on a triumvirate composed of Production Superintendent King Handley and two of his assistants, the methods engineer and general assembly foreman.

On the next level are the "team leaders," or line supervisors. These leaders, either male or female, are selected for their willingness to take responsibility, their understanding of the various jobs, their ability to teach and lead others, and finally, their potential for top supervisory work. "Teams" led by these individuals may contain from two to fifteen workers.

These workers, the third level of the "team system," are drawn from a reservoir of trained personnel which is made available through a continuous and intricate training program. Training begins the day an employee is hired and ultimately aims at creating a versatile employee "pool." Emphasis is placed on developing particular talents, and records are kept in detail showing the versatility of each employee on the job.

Avoidance of bottlenecks

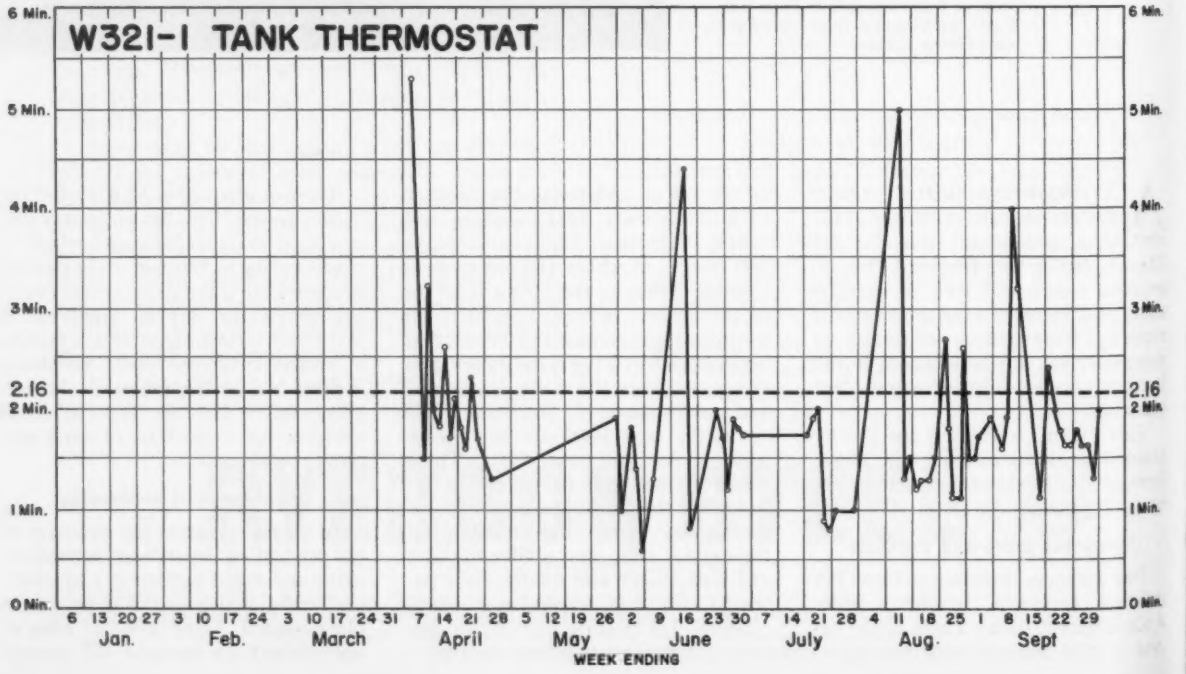
In actual operation the objective of the production department is to anticipate and avoid bottlenecks by shifting teams, or portions of them, to the place needed. Acceleration of sales of one product, for example, will prompt

A SIX-GIRL "team" at work on Iron Fireman stack switches, with line supervisor checking the operation. These girls are versatile enough to handle two or three different operations and work at keeping cost levels down, production up.

LEFT: Electrical motor assembly line with one of plant's machine sections to the right.

Graphic picture of tank thermostat production

AT THE END of each day line supervisors report to the production office the number of man-hours on each line and the quantity of final tested units produced. An hourly output is calculated and graphically presented to the line workers.



a shift of personnel from items of lesser priority.

Actual selection of people is made by the general assembly foreman, based on prior training and the particular talents of persons available in the "pool." Line supervisors do not enter into these decisions. They supervise, rather than select, the teams assigned to them. This avoids hoarding of good personnel by any one supervisor.

While supervisors may request certain individuals from the "pool," they cannot keep them indefinitely, and any final decisions are made by the general assembly foreman, based on priorities established by the production department. Conventional methods (where individuals are assigned to a job under a particular foreman for an indefinite time) oftentimes result in wasted man-hours and poor quality simply because round pegs are in square holes.

Absenteeism is an ever-present problem. The existence of a trained "pool" of workers minimizes this problem, and no high priority line ever suffers from absentee workers. Conversely, there is oftentimes a surplus of help. In such instances, an analysis of future production requirements shows where teams should be assigned to best utilize their talents.

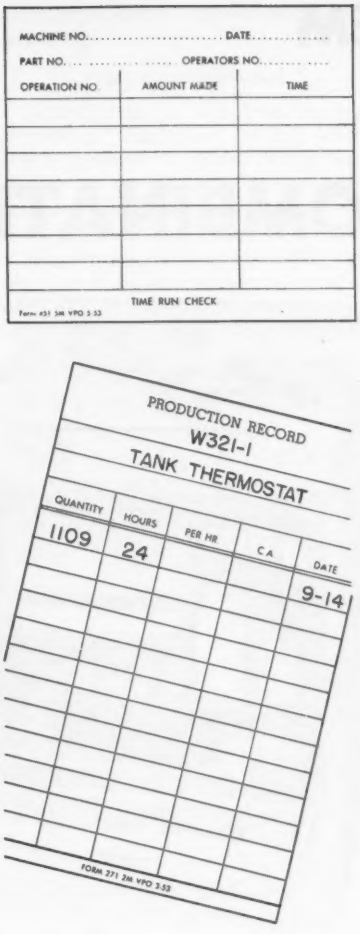
There are two very important considerations in making the "team" system operate to its best advantage: (1) training and evaluation of personnel, and (2) establishment of work standards. Adequate records maintained on both people and jobs make this effective.

Trainees

When an employee is hired, he or she becomes the ward, in effect, of the foreman and personnel director. It is the foreman's job to train and evaluate this employee and explain the company and its team method of operation. It is emphasized that the future of his or her job depends upon ability to learn and being present for work without needless absenteeism.

During a 30-day probationary period, the foreman closely supervises and checks new employees against predetermined standards on a series of varied operations. In the meantime the personnel director carefully checks their references and personal habits to make sure they are desirable employees. If the new employee meets all these requirements satisfactorily during this 30-day period, he or she is so advised and is then considered permanent.

If, however, the new employee (1) fails to learn on a variety of different types of work, (2) should appear on the absentee list excessively, or (3) is found to have undesirable traits, he or she is immediately released.



TOP CARD: Each day individual operators fill out simple job slips indicating their clock number, operation worked on and pieces completed. These slips are manually recorded each day in an operation cost ledger which contains the standard time. BOTTOM CARD: This is the form used by the line supervisor to report man-hours and production quantity.

Personnel relations are excellent. Both management and union guard them carefully, making sure company policies are fair and honestly administered and that union members fulfill their obligations. To promote further plant efficiency and company-employee good will, a joint "labor-management" committee has been organized, incorporating management, foremen, union officials and employees.

This group meets one evening a month to discuss problems and make constructive suggestions relative to the operation. Top management uses these meetings to brief its employees on company plans for the future, engineering progress and other items of general interest. Grievances, as such, are never discussed at this meeting.

How is efficiency measured? The division has established standards of time and cost for the different operations and is constantly reviewing these standards and setting new ones as new operations occur. This is done by first working out what seems to be the best way of performing a new operation and then assigning to it workers with varying degrees of ability.

Average costs figured

Carefully kept time-per-unit records set an average or standard which is judged fair and, accordingly, an average unit cost. The methods engineer is constantly looking for better ways of doing the job and in this connection oftentimes utilizes a line worker's suggestion.

Each day individual operators on machines fill out simple job slips indicating their clock number, operation worked on and pieces completed. These slips are manually recorded in an operation cost ledger which contains the standard time. The recording clerk makes a mental calculation to determine whether or not the particular slip represents a sub-standard worker. Such slips are returned to the line supervisor for immediate investigation. Periodically an operator's slips are tabulated for purposes of personnel evaluation.

Standards have also been established for the final assembly lines, and an optimum relationship between number of people and quantity of output has been determined. Since all final assembly operations are not of equal time value, considerable method study is involved in determining this optimum relationship.

Efficiency results

At the end of each day, the line supervisor reports to the production office the number of man-hours on his line for that day and the quantity of final tested units produced. An average hourly output is calculated and graphically presented to the line workers, along with the standard hourly output. This provides a visual check of efficiency results.

While the foregoing deals primarily with production methods, quality of product is not overlooked. Inspectors are constantly on the job and all units are line-checked and final-tested. Poor workmanship is not tolerated.

The "team" system is possible only through the establishment of a trained "pool" of employees. Operating throughout the entire plant, it is, in effect, one big team working for one big objective, and to all appearances doing a very good job.

DESIGN PROBLEM

COMPACT COMBINATION KITCHEN

SPACE and dollar savings are the outstanding feature of this combination sink, stove and refrigerator designed for use in motels, resort cottages and apartments.

The solution qualifies for an award

TO PROVIDE a three-burner stove, a 4-cu. ft. refrigerator and a sink in a space 36 in. high, 27½ in. wide and approximately 30 in. deep, was the problem that faced General Air Conditioning Corp. The company had been making stove-refrigerator combinations for three years when requests for adding a sink to the unit were received.

New member

The addition of a sink to the stove-refrigerator was amplified by the requirements to:

1. Maintain the stove-sink height at 36 in.
2. Maintain the space-saving features of existing models.
3. Provide a practical burner arrangement with the addition of the sink.
4. Save tooling costs by using as many of the parts of the existing models as possible.
5. Design the stove section to use gas and electric burners interchangeably in production.
6. Design the sink-stove section as a unit for easy removal from refrigerator section.
7. Design the unit so that enclosed installations are possible.

These requirements of the sink-stove-refrigerator combination were attacked in the following manner:

Use of as many parts as possible from existing models limited the dimensions of the final unit. Width was limited to 27½ in. so that the existing inner liner and door assemblies could be used. Height was limited to 36 in., which matched kitchen counter dimensions.

By
EARL B. JACKSON
Chief Engineer
General Air Conditioning Corporation
Los Angeles

With the width and height dimensions fixed, only the depth could be varied. Even so, the depth could only be increased from 22½ in. to a maximum of 30 in.

Space problem

The 5-in. deep sink presented the next problem. To maintain a height of 36 in., the refrigerator section had to be lowered. This lowering also provided room for the burners.

In the process, the Tecumseh hermetically sealed compressor had to be relocated. The only possible location was on the back of the unit. The compressor was mounted on an extended back base. The condensor was then mounted in position under the refrig-

erator and behind the storage drawer in almost a horizontal position.

To allow space for plumbing connections and accessibility to the compressor, removable access panels were provided on the sides at the back of the unit.

The stove-sink top section presented the big problem of designing for appearance, strength and ease of assembly. A drawn two-piece top was decided upon. The sink is drawn separately and arc welded into position. This method of fabrication provided the strength needed, with very little warpage from the stove section after the sink has been welded into place. The sink and the back splash give the necessary rigidity to the finished porcelained top.

Warpage eliminated

Warpage due to heat from the gas burners is eliminated by the additional strength supplied to the top section by the gas manifold securely fastened onto the under side of the top.

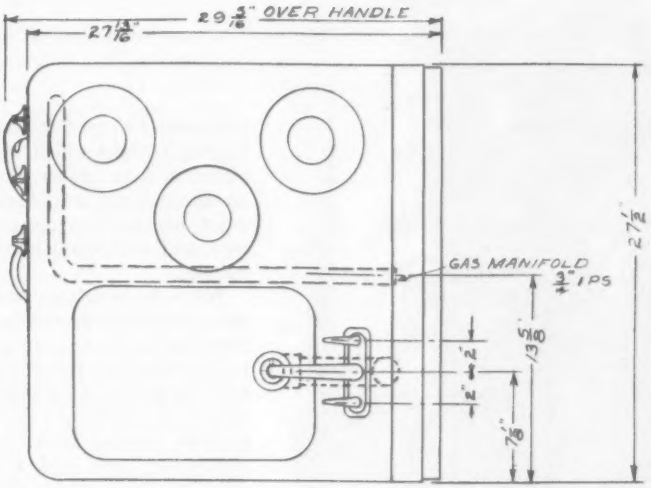
The burner and sink assemblies are separate from the refrigerator section and may be removed at one time by removing four screws holding the sink-stove top in place. Using this design, it is possible to install the combination unit into spaces only 29½ in. wide and 29½ in. deep.

Wins design award

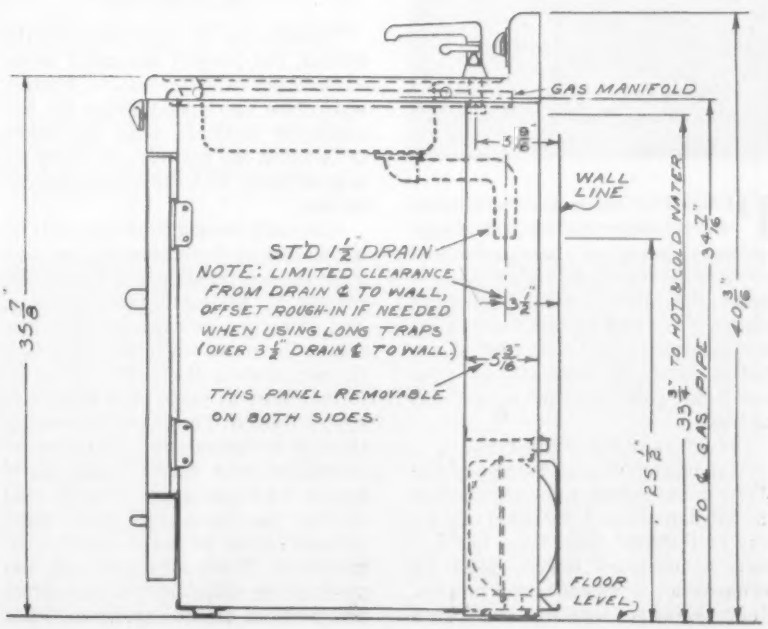
This article tells the "How It Was Done" of designing a sink-stove-refrigerator combination.

It resulted in General Air Conditioning Corporation winning the Second Annual Hess Brothers Award for versatility in design and use. Hess Brothers, of Allentown, Pa., instituted this award to encourage American manufacturers to design products that are practical, versatile and utilitarian as well as attractive.

A complete kitchen rolled into one compact 30 x 30-in. unit



THE UNIT comes equipped with three gas burners (for natural or bottled gas) and with three electric burners (for 220-volt installation) or with two electric burners (for 110-volt use). The entire top of the unit is porcelain and a storage drawer is located beneath the refrigerator compartment.


GAS MANIFOLD
WALL LINE
STD 1½" DRAIN
NOTE: LIMITED CLEARANCE FROM DRAIN ℄ TO WALL, OFFSET ROUGH-IN IF NEEDED WHEN USING LONG TRAPS (OVER 3½" DRAIN ℄ TO WALL)
THIS PANEL REMOVABLE ON BOTH SIDES.
35 7/8"
25 1/2"
33 3/4" TO HOT & COLD WATER
TO ℄ GAS PIPE
34 7/16"
40 3/16"
FLOOR LEVEL

ANOTHER EXTRACT FROM WOOD

A water-soluble binder and adhesive from Western Larch, to replace now imported gum-acacia

PENDING one final development, the substance known as Arabogalactan is poised on the threshold of entry into American industry as a home-grown water soluble binder and adhesive. It could replace much of the now-imported gum acacia used in cosmetics, candy, pharmaceuticals, pulp and paper, paint, ceramic colors, inks and oils.

Only its color is holding it up.

Arabogalactan is an extract of the Western Larch tree, and researchers in the Western Pine Association laboratory at Portland, Ore., have found it may be obtained rather easily by means of a proper extraction process. But its industrial uses are limited until a way can be found to eliminate color-tinging tannins which leave the substance a dirty brown. Procedures for an economically feasible elimination of color are undergoing careful study now, and results may be shortly forthcoming.

When Arabogalactan was first found to be producible in sufficient quantities from the Larch tree, samples were sent to manufacturers throughout the country. The prime and almost only objection to the material's use in their operations was that color. Should that be eliminated, they said, or even moderated to some extent, they are ready to use it.

Tannin removal

Tannins can be removed from the extract, but present successful methods have proved too expensive. Further tests show good possibilities for less expensive methods, with the colors to be taken out entirely, or nearly so, in accordance with the manufacturers' desires.

A sawmill cutting 50,000 to 100,000 board feet of Larch lumber per day could recover possibly 5,000 to 10,000 pounds of Arabogalactan each day. The extraction process involves first converting waste wood into chips in a chipper. Unless the chips are to be further used as pulp, their quality is not too critical. The chips then are run through a thermoscrew extractor—a cylindrical tube with a hollow screw pulling the chips along. Steam is used to heat the chips, and water flows countercurrent to their direction of movement. Water serves to soak and pre-heat the chips, as well as extract first portions of Arabogalactan. Then the chips (unless to be used in pulping) are run through an attrition mill and ground to sawdust size. They are washed again, with further Arabogalactan being gathered.

When the Arabogalactan and tannin-containing water is finally vacuum distilled off, the pulp substance remains. Only the step to make it colorless, or nearly so, remains to be taken.

At present some 20,000,000 pounds of gum acacia is imported into the United States. It comes from the acacia tree which grows predominantly in the Mediterranean and Anglo-Egyptian Sudan areas under British control. The price in this country at present is from 25 to 30 cents per pound. However, it is expected that the British would drop the price considerably should any competition arise. Nevertheless, Western Pine researcher reports indicate Arabogalactan could be marketed competitively even under these conditions.

Prospective utilization

If full development of all processes being studied in Arabogalactan extraction from Larch can be completed, one of the most complete utilizations of wood and its by-products may result.

High quality Larch chips which today are being used as pulp, could provide the Arabogalactan. Then, if tannins can be extracted from Arabogalactan, the tanning industry has a ready use for them. Tannins also can possibly be used as a part of the mixture of well-drilling muds in oil fields. The remaining, and colorless, Arabogalactan seemingly has its commercial market ready and waiting for it.

POWER is transferred from the loading conveyor at right of picture to the built-in conveyor on floor of the van at left.

LOOKING from inside the warehouse, along the automatic conveyor and into the truck van.

AUTOMATIC LOADER CONVEYOR KEEPS REDWOOD LUMBER DRY

EXERCISING considerable ingenuity, Geneva Lumber Co. at Orick, California, has reduced lumber damage in loading, transporting and unloading through use of an unusual loading conveyor. Geneva loads all kiln dried redwood lumber in totally closed, semi-type vans for protection from rainfall while being trucked to railroad spurs in Arcata.

A great deal of the value inherent in kiln dried select redwood lumber lies in the clear, rich sheen of unstained lumber. The redwood region is renowned for its high annual precipitation, and so, to protect this top grade redwood from the elements and from loading and transportation damage the need for an efficient method of unit loading becomes obvious.

Necessity being the mother of invention, Emil Hansen, mill superintendent, set about designing and constructing a unit load conveyor affording maximum protection with minimum operating and loading costs.

This loading conveyor, which has been in use for approximately 18 months without the least bit of trouble, consists of a wooden loading dock or platform 32 ft. long, 6 ft., 11 in. wide, and 4 ft. high. A three-phase, 5-hp. gear head electric motor supplies power to the loading conveyor both on the dock and inside the van. To convey lumber from the loading platform onto the van, two No. 82 chains sliding in 4-in. channel iron at the rate of 22 ft. per minute are utilized.

Truck kept from settling

At the head of the conveyor table a stand has been constructed to engage the rear of the van in order to prevent the truck bed from settling during loading. Heavy timbers are mounted as guides on either side of the approach to the conveyor to insure perfect alignment of van and conveyor. Power is transferred from dock to truck by means of sprockets and chain drive. Inside measurements of the van being used are 30 ft. x 7 ft., 2 in. x 8 ft., 1 in.

Standard units are made up as near 40 in. wide and 44 in. high as possible. These units contain lengths from 3 to 8 ft., 9 to 14 ft., or 15 to 20 ft. Units are loaded by lift truck two high and two wide on 3 x 12 bolsters sitting on the conveyor chains.

A fully loaded van normally contains 8 units totaling approximately 12,000 board feet of rough board or 16,000 to 18,000 board feet of surfaced stock.

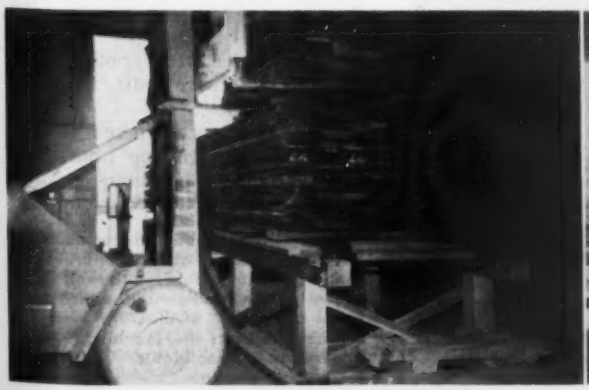
Prior to loading, each unit is individually strapped with a ¾-in. steel band. After these are placed on the platform, ¾-in. steel bands are run completely around each group of four units, binding them together into a single large unit.

One-half to three-quarters of an hour is required for a fork lift truck to load and band one van load. Less than 10 minutes are consumed from the time the van backs into position, is loaded, closes door and drives away.

Unloading of the van at the other end is handled by Brero and Company, Arcata, California. Portable conveyors similar to the one described above are used. The lumber is then either loaded into a warehouse for storage or routed directly to box cars.

LIFT TRUCK loading a banded unit of lumber to make up a van load.

12,000 BD. FT. of rough, kiln-dried redwood lumber ready for loading van.



Get the most from . . .

YOUR POWER TRANSMISSION EQUIPMENT

The first of three installments dealing with selection and maintenance of transmission equipment

GEARED speed reducers and increasers are power transmission devices that reduce or increase rotary speed derived from an electric motor or other prime mover. Their objective is to best adapt power for the particular purpose in mind and hold the speed ratio between the prime mover and the driven machine constant.

Various kinds

Different variable-speed mechanisms are used for variable-speed reduction. We shall limit our remarks to constant-ratio speed reducers and increasers connected to the prime mover at the point of use.

Generally, a speed reducer is connected to a motor with a flexible coupling, though there are occasionally other arrangements. The output shaft is also connected to the machine being driven by a flexible coupling. These couplings reduce shock imposed on gears in the reducer because they absorb a considerable portion of it. Slight misalignments which may occur between motor shaft and reducer input shaft, or between reducer output shaft and machine drive shaft, will be of lesser seriousness.

In some instances where it is desirable to protect gearing from shock, a fluid coupling has been employed

WORM GEAR speed reducer shown in the foreground of above picture has a ratio of 29.5 to 1. It drives the roll feeder shown in the background, which is located above one of the 78 x 24-in. ore-crushing rolls in the leaching plant of Inspiration Consolidated Copper Co., Inspiration, Arizona.

between a driving motor and speed reducer. With such an arrangement, gearing is fully protected even though the machine might be completely stalled.

Though first cost of this fluid coupling is high, it may well be worth while in some cases as insurance against damage.

Chain and V-belt drives

In some instances, a V-belt drive is interposed between a driving motor and a geared speed reducer. Such a drive provides considerable cushioning, and takes care of the high-speed end of the drive nicely. Also, a chain drive may then be used between the output shaft of the speed reducer and the machine drive shaft.

Such an arrangement is worth while in cases where a speed reducer is giving just the right reduction. Otherwise this reduction cannot be obtained without having the reducer specially built, at an additional expense not considered justifiable. Any discrepancy in actual reduction of the geared speed reducer may be compensated for in the V-belt drive, the chain drive, or both.

However, some manufacturers will build special speed reducers to provide precisely the speed reduction required.

Many advances have been made in metallurgy providing better gear and bearing materials. Both are highly important in speed reducer design. There has also been progress in machining processes for gears and in obtaining a better understanding of finer points in gear design. These things add up to production of far better speed reducers than it was possible to produce a decade or two ago.

In consequence, many manufacturers having geared speed reducers of very great age are finding it profitable to replace them with more modern units, just as they replace other obsolete equipment.

Even the finest and most modern reducer must be properly used if its full efficiency is to be obtained. Shaft alignment must be as nearly correct as possible, regardless of the fact that flexible couplings are employed for connection. Mounting for any relatively heavy speed reducer must be firm and secure, if initial proper alignment is to be maintained for satisfactory operation.

A maintenance man should check these things periodically, to avoid possible development of inefficiency. High friction, with attendant restricted action or mechanical straining of the reducer, may result if any misalignment develops.

Single and multiple-stage reduction

Speed reducers are referred to as single-reduction, double-reduction or triple-reduction, depending on whether one, two or three speed transformations are incorporated between the input and output shaft. More than four steps in reduction are seldom or never used.

There is both a mechanical and a cost advantage in using the smaller number of steps. This has made worm gear reducers popular with many manufacturers due to the larger amount of speed reduction obtained with a single worm and gear set.

Designers of speed reducers generally work toward the goal of incorporating more power in less space, but there is a limit in this direction, imposed by the fact that generous-sized housings are valuable from certain standpoints. Larger housings for worm-gear reducers, for instance, give more room for a generous-sized oil sump in the housing, which is definitely valuable.

The larger the housing of a speed reducer, the greater amount of heat it will dissipate through radiation. There is also the possibility of pumping oil, and the possibility of artificial cooling, which may and doubtless will be used more freely in future.

Lubrication and cooling of worm gear speed reducers is an interesting aspect of their design. Reducers having their gears lubricated by immersion in an oil reservoir require careful sealing to prevent oil escape through the bearings. Stuffing boxes, cartridge-type seals and lapped carbon-ring-type shaft seals are all employed by different makers. Some use automotive-type oil seals on the gear shaft to prevent oil leakage.

Grease-gun fittings

In some designs sufficient lubricant may not find its way to upper bearings by the splash method. Consequently, pressure grease-gun fittings are installed on these bearings. One firm using grease-gun fittings in this way makes use of oil seals of the Chevron type or shape. On vertical type worm gear reducers having a downward shaft extension, two seals are provided at the downward extension.

It is naturally necessary to make more than ordinary provision to prevent leakage of lubricant at any downward shaft extension. One builder of vertical worm gear speed reducers makes use of an encircling shell of metal in the inner casing, which holds oil in the reservoir away from the shaft.

This provides what is sometimes

THIS friction drive tube mill at Monolith Portland Cement Co., Monolith, Calif., has a dual drive arrangement through two Jones herringbone gear single reduction speed reducers. Two units shown have a reduction of 4.71 to 1, and are driven by 200-hp., 720-rpm. motors.

termed a "dry well," through which the shaft extends and in which it revolves. In this case, both of the vertical or gear shaft bearings are grease lubricated.

The lubrication problem on worm gears differs from that of other types of gearing used in speed reducers, because contact between worm and wormgear is of a sliding nature. Some manufacturers recommend addition of around 5% acid-free tallow to oil used. Actually, however, speed at which such a unit is operated has much to do with lubricant employed.

Low-speed operation of 600 rpm. or below, results in low rubbing velocity and high tooth loads. Oil of exceptionally heavy body is required for such operation.

At higher speeds, a heavy oil is required for worm gear reducers, but must be of considerably lighter grade than for slow operation. Where the unit is working out of doors in low temperatures, an oil must be light enough to flow properly at expected temperature. Reducers having their bearings lubricated on the splash principle must often be provided with a somewhat lighter oil, to insure sufficient freedom of splash and flow, allowing oil to reach and lubricate all bearings properly.

Recommendations

Reputable oil refiners can give proper recommendations as to what oil should be used in given speed reducers used under specific conditions. Many manufacturers of speed reducers provide their own recommendations for their own units.

Oil changes should be periodic but seldom need to be very frequent under ordinary operating conditions. If a reducer is subjected to especially high temperatures, to conditions of extreme moisture, or to damaging types of chemical fumes, oil changes must be more frequent.

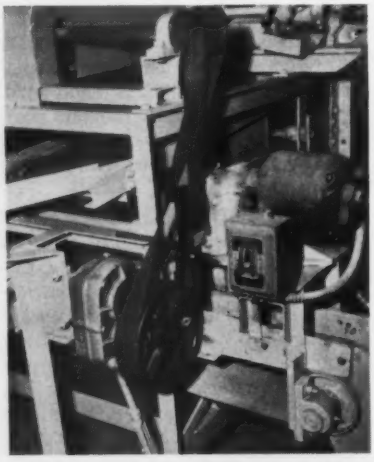
Sludge formation is used as a guide in establishing a proper period of time between oil changes, on the principle that sludge should not be allowed to form. Thus, if the man responsible for making oil changes notes sludge formation in a given reducer, he shortens the period of time until the next change of oil. If at that time he again finds sludge, the period of time is shortened again. This process continues until sludge formation no longer occurs.

A considerable temperature rise can occur in the average worm gear reducer without doing the mechanism any actual harm. Usually it is considered safe as long as total operating temperature does not exceed 200 deg. F. In cases where there is a question of this temperature being exceeded, it is best to check by means of a thermometer.

Some men try to check possible overheating by laying a hand on the reducer casing, but it is doubtful whether there are any who can accurately estimate temperature in this way.

Artificial cooling

In cases where artificial or auxiliary cooling is employed, it is no longer necessary to limit output of a worm gear reducer by thermal capacity of the case. Air cooling, as employed by some reducer manufacturers, is an interesting case in point. Certain units are lubricated by a method which does not require submerging the worm in oil. The result is that pumping action of the worm is eliminated, no stuffing box is required on the worm shaft, and efficiency of the units is considerably improved.



HERE is a case in which a flat, twisted belt is used in connection with a shaft-mounted torque-arm speed reducer. The torque arm with its turnbuckle can be seen in part, extending downward from the shaft-mounted speed reducer, which is here used to drive a bean grader and picking belt at the plant of the Eugene Fruit Growers Association, Eugene, Ore.

Part of the power saved by this means is employed to drive a centrifugal fan mounted on one end of the worm shaft. The fan draws air through a housing and expels it around the sides of the worm-gear case, which is provided with ribs or fins to aid in cooling. Advantages are gained from this method chiefly for speeds exceeding 750 rpm.

The worm always has its axis horizontal, but the shaft on which it is mounted is horizontal in many units. Theoretically and design-wise, the worm gear may be laterally swung completely around the worm. Thus, worm gear units with their output shaft at any selected degree of obliquity in a given vertical plane are a mechanical possibility.

Vertical shaft units are found chiefly on agitator drives and drives for overhead chain conveyors.

Worm gear reducers are available over a large ratio range, though this differs with manufacturers. One builder, for instance, provides a ratio range extending from 4⅛ to 1 at one extreme to 71 to 1 at the other, and also provides special ratios outside this range on request.

Some firms will provide units with double-reduction worm gearing, and one firm provides such units in a range of standard ratios extending from 86.9 to 1 to 4108 to 1, with other ratios available if the customer desires.

Worm gear advantages

Worm gear reducers are often chosen for locations because they run very quietly. Where a quiet, powerful and dependable drive for a small machine is needed, the worm gear reducer is particularly desirable. If the speed-change ratio is low, they are even more advantageous. Worm gear reducers are often selected because they fit applications where it is necessary to "turn a corner" with power and at the same time reduce speed.

Whether the corner is turned horizontally or from horizontal to vertical, definite driving problems can often be solved.

A worm gear unit in low ratio has a very high efficiency rating, equal to that of a high quality herringbone reducer. Worm gear efficiency drops steadily and appreciably as speed ratio increases. A large power loss is involved in high-ratio worm gear installations requiring large capacity and continual operation. Other things being equal, worm gear reducers should not be applied on such installations.

There are countless applications where the amount of power to be transmitted is quite low, ratio of speed change is low, or the unit will operate only intermittently. In all such cases, worm gear reducers can consistently be applied, because efficiency and power loss are not the chief factors involved.

Extension of the worm shaft on a worm gear speed reducer is an interesting point in design. It can be used to drive a centrifugal fan for cooling the unit, or made to serve as a light power take-off for auxiliary purposes. There are also cases where an extended worm shaft has been used to mount a brake drum.

Get the most from . . .

EACH KILOWATT HOUR

Tips on electrical testing

By PAUL H. HENRICHS, Asst. Industrial Power Engineer, Southern California Edison Co., Los Angeles

ALTHOUGH there are probably more voltmeters and ammeters being used for maintenance testing than all other instruments put together, these instruments alone do not provide sufficient information for intelligent analysis of the operation of the machine under test.

Necessary information should include voltage, amperage, power factor, wattage, and reactive volt ampere. Volts and amperes are the only component which can be gained by the voltmeter and the ammeter. As in solving a right triangle, two factors must be known in order to solve for the others.

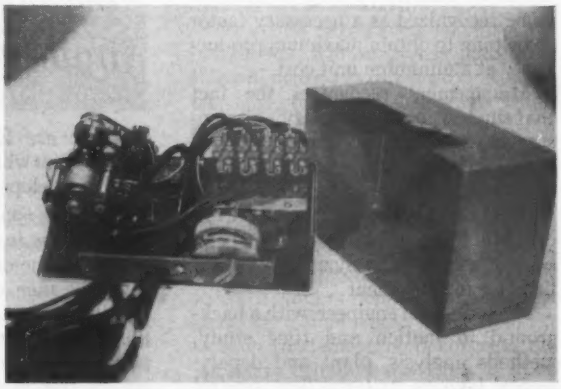
If a wattmeter is available watts can be measured. However, if a wattmeter is not available, then the power factor must be known in order to calculate the watts.

Since knowing volts and amperes does not tell how much work is being done, at least one more instrument is required.

The voltmeter and ammeter are insufficient for thorough analysis. Though we learn how much current is flowing and what voltage exists, we do not learn how much work is being done, nor what the power factor is. Both the amount of work accomplished and power factor determine the amount of your power bill.

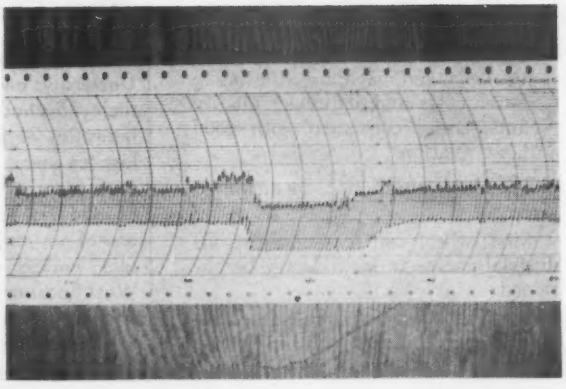
For the smallest customer this refers to kilowatt hours used, and for the larger customer the kilowatt hour used and the discount possible by maintaining good power factor.

By instituting a systematic period test of motors and recording findings, it is possible to keep them operating at maximum efficiency, thus getting the most value from the kilowatt hour registered on the service meter. This can also alert maintenance men to potential failure with resultant costly shutdown if test readings indicate a departure from the recorded standards of the machine.



INSIDE of a switch showing timing motor, cam, 4 P.D.T. relay, voltage selector switch, and step-down transformer for timer motor.

THREE items necessary for recording watts and vars on one chart: left, graphic wattmeter; right foreground, switch; right rear, phase-shifting transformer. By using appropriate phase-shifting transformer, this combination may be used without potential transformers at 120, 240, and 480 volts.



RESULTING CHART. Higher registration indicates watts for 35 seconds, and lower registration indicates vars for 25 seconds.

INDUSTRIAL ENGINEERS AS MANAGEMENT POTENTIAL

By E. W. FICHTER

BECAUSE the utilization of plant facilities, men, and machines requires a close integration in order to obtain the maximum efficiency and coordination necessary to a successful business, industrial engineers have become recognized as a necessary factor in helping to obtain maximum productivity at a minimum unit cost.

Management recognizes the fact that supervision, under today's circumstances, is generally "snowed under" with labor relations and government rules and regulations which, combined with production problems, make it impossible for the supervisor to spend adequate time in analyzing his operations for improvement.

The industrial engineer, with a background in motion and time study, methods analysis, plant and departmental layouts, material flow, control of materials, cost analysis, budgetary controls, waste control, materials handling, job analysis, and rate evaluation, can be a valuable consultant to supervision on all phases of production, quality, cost, and service problems.

Necessary steps

To accomplish this purpose, the industrial engineer must take the following steps:

1. *Sell labor* on the real facts of industrial engineering, outlining what it is, why it is utilized, how it can be of benefit to them.
2. *Sell supervision* on the basis that the program is a service for them in order that they may do the best job in the simplest way.
3. *Sell management* on the advantages of better utilization of plant facilities, men and machines resulting in lower costs and improved quality and service consistent with good labor relations.

The major questions to be answered are:

First, where can the supply of industrial engineers for industry be obtained?

Second, how can they be trained for management positions within industry?

Some suggestions to help you find the right kind and train 'em properly

There are four logical sources of supply from which industrial engineers can be developed:

Selecting men with no college background from industry. This group was originally the only real source of supply. The men drawn from the ranks had the distinct advantage of knowing their particular industry's products, policies and procedures. However, offsetting this in many instances was a lack of technical education, ability to analyze problems and to express them adequately for management.

Mr. Fichter attended Ohio State University, and for the past seventeen years has been associated with industrial engineering. During the last ten years he has been responsible for cost control and training of industrial engineers for a unit of one of our major industries. He has also worked closely with various West Coast universities in problems and programs relating to this field of engineering.

Selecting men with college background from industry. The personnel included in this category are men with company experience in functions other than the engineering field. They, like the group above, have the advantage of knowing their particular industry's products, policies and procedures.

Technical learning

They normally have the ability to think, analyze, and express themselves clearly and correctly. However, it is usually necessary to have these men take additional college training in the technical aspects of the industrial engineering field.

Selecting young men for technical training from industry. Here, we feel, is an excellent potential source of supply for the field of industrial engineering. These men must be screened carefully in order to make certain they have the "drive of accomplishment," for it is not easy to work on a part or full time basis and still carry a full load of college work. It can be done, however, and has been in many instances. From this group we have a combination of advantages:

1. They have already obtained to some degree the basic fundamentals of the company's products, policies, and procedures.
2. They concurrently are obtaining the technical education which should give them the ability to think, analyze, and express themselves properly.

Selecting formally trained industrial engineers. This category has the disadvantage of not being acquainted with the company's products, policies, and procedures. The advantages, of course, are obvious, since they have the technical knowledge and have been trained to think, analyze, and express themselves properly.

Training of industrial engineers for future management. This program can normally be divided into two phases: training factors and training methods.

Training factors

Human relations. The ability to get along with people is the number one

TWO of Fichter's industrial engineers checking a project on layouts.

item of importance and, therefore, must be the primary step undertaken in the training of engineers if a maximum of success is to be achieved.

Let us not be confused in our approach to human relations. The question is how far it can be carried and still obtain efficient management consistent with good labor relations.

There are personnel people who, unfortunately, approach this problem with the paternalistic attitude that the employee must be "protected" from injustice. They appear to feel that there is always an excuse for his mistakes, and that he should be given the advantage of many decisions rather than be made aware of his responsibilities to management.

Fairness must be maintained, but it cannot be a "one way street."

Company products must be understood by the engineer in order for him to be in a position properly to approach future problems. We do not necessarily mean the understanding of the formulas for producing the product, but what the company produces and the basic program of production.

Production equipment must be well understood by the engineer so that he may analyze its value in production and, later, be in a position to recommend possible changes to obtain maximum efficiency.

Quality standards are an important factor in every industry. This phase is particularly emphasized by the fact that wage incentive standards *must* make certain that quality will not be jeopardized.

Service requirements generally mean a close coordination between numerous production departments from a production scheduling standpoint. The industrial engineer is frequently called upon to analyze such analogous problems as long production and resultant warehousing costs, as compared to possible efficiency loss resulting from short production runs and direct shipments. Competition demands "service."

Personnel programs are a major though somewhat intangible function of industry. Industrial engineers working with people must have a comprehensive knowledge of labor negotiations, labor grievance procedure, union contracts, and general company personnel policies and procedures.

Accounting function is a necessity, for it is here that cost accumulation is made to determine costs of the company's product. The Accounting department develops cost account data for comparison of budgets as developed by the industrial engineers. The bonus standards, as they are installed, are normally calculated in the Accounting department.

It is of paramount importance to understand the accounting function, in order to make certain that budgets and bonus standards are not approached in such detail that savings in production are washed out by clerical requirements.

Purchasing must be recognized and generally understood from a policy and procedure standpoint by the engineer. The materials purchased are a major factor in development of quality, production efficiency and unit cost.

Industrial engineering technical requirements. The emphasis placed on this will depend in direct proportion to the background of the group being trained.

Motion and time study. The terminology of the above item is generally self-explanatory. The engineer must be trained in his company's grading or leveling techniques and, of prime importance, the correct approach to all levels of plant or department personnel in taking a time study.

Such fundamentals as covering the necessary people that a study is to be taken, an explanation to the worker being studied that the engineer will be glad to answer any questions after the study has been taken, and never to sit down or lean against a post while taking a study are important.

Methods analysis. Generally, methods analysis is developed concurrently with time and motion study; however, in many instances methods analysis is a separate and distinct problem in itself.

Plant and/or departmental layout. Training of the industrial engineer in this field is of great importance. The

FICHTER with part of his staff during a meeting.

development of flow charts is a necessary tool to the engineer.

Material flow. In order to lay out a plant or department properly, it is necessary to study and chart the flow of material through the plant or department.

Maintenance of wage incentive plans. This is of extreme importance. The engineer must be trained to see that bonus installations are adequately maintained at all times. The failure to do this will result in personnel dissatisfaction, and will cost management heavily in costs, production and personnel relationships.

Loose bonus standards

It might be well to point out here that there is some feeling in management circles condoning and advocating the development of "loose" or "sloppy" bonus standards because of a seemingly poor attitude of many workers who are not interested in giving a fair day's work. As a result, this group is unable to attain standard.

Management that appeases the workers by loose standards is making a grave mistake.

Material handling. This is fast developing into a specialized field, but it is of value to the engineer to be acquainted with all materials handling problems.

Cost analysis. Efficient management is always interested in the eventual savings which will accrue with certain expenditures. It is necessary for the engineer to be trained in developing this data for presentation to management. The major points to remember are: (1) obtain the facts, (2) analyze the facts, (3) present the facts, and (4) sell the facts.

Budgetary controls. Where wage incentives are used, it is only logical to utilize the bonus standards as the budget. The development of objectives and forecasts is also important.

Job analysis and rate evaluation. The training in this field is most helpful. Rate structure in many instances is a function of personnel. The major drawback is that many personnel people have a propensity to be prejudiced rather than objective.

It is logical that the industrial engineer, being fully acquainted with the various factors involved in the job, and quite often being responsible for changes in duties and crew sizes, is in an excellent position to make the original and necessary revisions through analysis and rate evaluation.

Training methods

There are several methods in use by industry for the training and development of management personnel.

First, there is the formal long period type of training whereby the employee spends from one to three months in various departments becoming acquainted with the operations, policies and procedures, etc. The employee may do actual labor work during this training or only observation, depending on the Union relationship in any particular company. This training can take from six months to two years, again depending on the industry.

Second, a combination of the trainee being in various departments, as in the above program, plus daily formal conference discussions in the particular department involved is quite often used.

Third and probably most effective program is to "learn by doing." Trainees, when coming into industrial engineering, should spend from two to three days in each department and observe the production, industry terminology, and equipment, and become acquainted with supervision. A formal report should be written.

Program length

This program, depending on the type of trainee and industry involved, can take from two weeks to three months. The trainee is then brought into industrial engineering and assigned clerical and detail work under close supervision. During this period of approximately three to six months, the employee will be learning policies and procedures relative to industrial engineering, departmental program, operations, etc.

The next step is to assign the trainee to an experienced engineer to begin the process of "learning by doing." This requires close supervision, and will take from six months to a year, again depending largely on the ability of the trainee. Added responsibility is gradually given the engineer, with less controlled supervision.

This program is continued until he is given full responsibility for a department or group of departments. This phase of the program may require an additional year to two years.

* * *

The proper selection and adequate training of industrial engineers will provide industry with potential young men capable of analyzing and expressing clearly to management those problems which are the tap roots of all business success, lower costs, better quality, greater productivity per man-hour consistent with good and realistic labor relations. This combination must be maintained if we are to continue America's success in building the highest standard of living in the world today.

FOR COPPER AND BRASS MILL PRODUCTS SEE THESE

REVERE DISTRIBUTORS

ON THE PACIFIC COAST

AMERICAN STEEL WAREHOUSE CO.
425 N. E. Ninth Avenue, Portland 14, Oregon
Phone: EAst 9111

AMERICAN STEEL & SUPPLY CO.
44 & 51 E. 7th St., Eugene, Oregon
Phone: 4-6291; 3-4126

EAGLE METALS COMPANY
4755 First Ave. South, Seattle 4, Washington
Phone: LAnder 9974

East 320 Trent Ave., Spokane 8, Washington
Phone: MAdison 2419

2336 North Randolph, Portland 12, Oregon
Phone: TUxedo 5201

PACIFIC METALS CO., LTD.
1400 So. Alameda St., Los Angeles 21, Calif.
Phone: PR 0171

3100—19th Street, San Francisco 10, Calif.
Phone: Mission 7-1104

261 W. 5th South St., Salt Lake City 4, Utah
Phone: 22-3461

19 No. 4th Street, Phoenix, Arizona
Phone: ALpine 4-0369

1533 India Street, San Diego, Calif.
Phone: FRanklin 9-5826

TAY-HOLBROOK, INC.
3530 Chester Avenue, Bakersfield, Calif.
Phone: BA 5-1221

940 Broadway, Eureka, Calif.
Phone: HI 2-4516

920 "M" Street, Fresno 18, Calif.
Phone: 6-8231

900 Alice Street, Oakland 7, Calif.
Phone: TE-2-4200

1801—22nd Street, Sacramento 4, Calif.
Phone: HI 6-3841

P. O. Box 969, Salinas, Calif.
Phone: 2-4771

605 Old County Road, San Carlos, Calif.
Phone LY 3-7631

165—8th Street, San Francisco 1, Calif.
Phone: MA 1-6800

695 Stockton Avenue, San Jose, Calif.
Phone: CY 2-3606

251 Roberts Avenue, Santa Rosa, Calif.
Phone: S.R. 6400

1234 So. Aurora Street, Stockton 8, Calif.
Phone 4-4841

1595 E. 2nd Street, Reno, Nevada
Phone: 2-6907

UNION HARDWARE & METAL CO.
5555 E. Ferguson Avenue
P. O. Box 3070, Terminal Annex
Los Angeles 54, Calif.
Phone: UNderhill 0-2411

REVERE

COPPER AND BRASS INCORPORATED
Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

LOS ANGELES: 6500 East Slauson Ave. Underhill 0-3331; SAN FRANCISCO: 116 New Montgomery St. Sutter 1-0282; SEATTLE: 1331 Third Ave. Main 1401

Rome-Turney water-cooled condenser coil. Tube is ⅜" O.D., .042" ga., bent on a 1⅜" centerline diameter. Soldered helical fins are .135" wide, spaced 14 turns to the inch. Other types of heat exchanger coils are also shown. Rome-Turney forms coils out of tube up to 40 feet long, without joints.

For Copper Tube that can be BENT

Rome-Turney sees REVERE

Most of the Revere Metals are fabricated by usual methods into conventional products. Some of them, however, appear on the market in forms that are unusual and possess special advantages. Take these helical-finned copper coils produced by the Rome-Turney Radiator Co., Rome, N. Y. It takes extra skill to produce coils with such small radii. The company can produce the coils shown on a commercial basis, for use in air conditioning apparatus, air compressors, and general heating and cooling applications where compactness plus high heat transfer rates are essential.

How it is possible to make such tight turns is Rome-Turney's secret. Revere does not share in it, nor does Revere want to reveal a secret of its own, which is how we turn out copper tube in a special bending temper for an application such as this. All we can say is that the two methods dovetail very nicely. If you need copper tube that can be bent easily, and offers you as well the advantages of corrosion resistance, high heat transfer, easy joinings, see Revere. We also make copper pipe, tube in copper alloys, aluminum alloys, and electric welded steel tube. If required, the Technical Advisory Service will gladly collaborate with you, as it has with Rome-Turney, on selection and specification matters. Get in touch with the nearest Revere Sales Office.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.— Sales Offices in Principal Cities, Distributors Everywhere

LOS ANGELES: 6500 East Slauson Ave. Underhill 0-3331
SAN FRANCISCO: 116 New Montgomery St. Sutter 1-0282
SEATTLE: 1331 Third Ave. Main 1401

WHEELS and springs from a disassembled lumber truck ready for inspection.

CHASSIS of heavy-duty logging truck stripped down to the frame.

PREVENTIVE MAINTENANCE PROGRAM BEATS LOGGING DOWN-TIME COSTS . . .

HAMMOND Lumber Co., Humboldt County, Calif., has managed to meet the problems of excessive wear and tear on their heavy-duty logging equipment by establishing an extensive and exacting preventive maintenance program.

Their large fleet of off-the-highway logging trucks, road construction equipment, tractors and light trucks are regularly brought into the shop for a careful and complete stripping and rebuilding. This program is designed to prevent breakdowns resulting from the punishment this equipment normally suffers. Such breakdowns destroy the delicate balance of redwood logging operations and result in costly down-time.

Centralized shop

All repair work is done in a carefully laid-out logging repair shop centrally located in the company's holdings near Big Lagoon. The development of the present program, which was started from scratch, has come only after considerable trial, error and research.

Many large lumber companies have found it advantageous to forego the use of public roads for their logging operations in order to make use of their gigantic trucks loaded far beyond limits allowable on public roads. Through many years of experience, Hammond has found that the breakdown of one of these loaded trucks far out in the woods results in such a terrific loss that a complete repair shop is necessary both for preventive maintenance and for swift repair of equipment breaking down on the job.

The fleet of off-the-highway logging trucks consists of 24 Mack and Peterbilt logging trucks equipped with 10-ft. log bunks. Under the present program each of these units is completely overhauled once every 2 years. Thus, a new truck is brought into the shop every month.

Stall for rebuilding

One large stall in the shop has been reserved specifically for this rebuilding work. When a truck is scheduled for its turn in the shop, it goes first to the wash rack for a good cleaning, after which it is run into the stall where a two-man crew strips it down to the bare frame. The frame is then taken to the steam cleaner and thoroughly cleaned and returned to the stall where it is placed on wooden blocks and examined for cracks and loose rivets. Frame cracks are welded, new rivets are put in where needed, and then the reassembly begins. It is usually found that the rear carrier assembly is cracked and in need of welding repairs, and cross members of the frame are generally in need of complete refabrication. New bolts are used throughout the reassembly.

Special departments

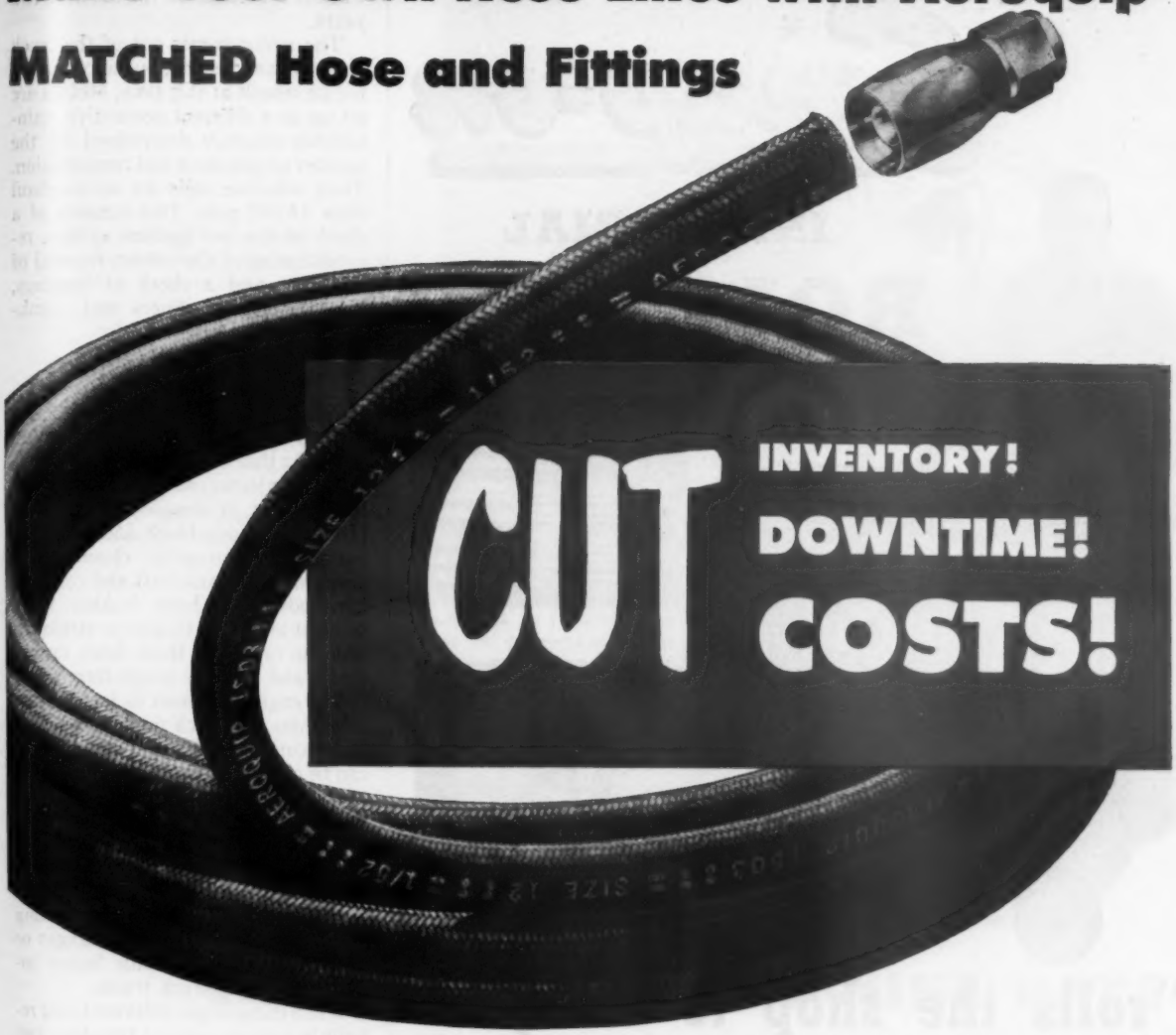
Various component parts of the truck are sent to special departments of the shop where they are overhauled, rebuilt and returned to the rebuilding stall by specialized mechanics.

The truck cab goes to the body and fender repairman, who generally finds considerable work to do. Often a complete new floor is needed and considerable work is done in hammering out dents and straightening doors. The cab is then completely rewired, sanded and repainted.

The rear ends and transmissions are handled in a separate department where they are completely stripped and rebuilt. As many of the old parts as possible are utilized, keeping in mind that rebuilt units must serve

A KING-SIZE off-the-highway logging truck loaded with redwood logs on 10-ft. bunks.

Make Your Own Hose Lines with Aeroquip MATCHED Hose and Fittings



Aeroquip Fittings are designed, developed, and produced to go with Aeroquip Hose. They form such a foolproof combination that Aeroquip *guarantees* performance. Thus, the hose lines made right in your own plant always measure up to Aeroquip's exacting standards of quality, the highest in the industry. A small supply of Aeroquip Bulk Hose and Fittings assures you of quick hose line replacements at all times . . . and Aeroquip Fittings are detachable and may be used again and again when making new hose assemblies.

Aeroquip

REG. TRADE MARK

AERO-COUPLING CORPORATION

(A Subsidiary Of Aeroquip Corporation)

3015 Winona Avenue, Burbank, Calif.

SALES OFFICE and WAREHOUSE for OREGON, WASHINGTON and IDAHO: SPARKS-WILLS, INC., 1624 S. E. GRAND AVE., PORTLAND 14, ORE.

Snap-on*

INDUSTRIAL ROLL-CAB

All drawers roll on easy, "non-spill" slides, preventing "pull-outs."

Two powerful foot brakes anchor Roll-Cab to floor instantly, release at a touch.

"rolls the shop to the job"

You'll speed up *any* maintenance job when you give a man the needed tools, plus a sturdy bench, right at arm's reach, anywhere in the plant. That's what a Snap-on Roll-Cab does. It ends those repeated trips back to the tool crib. Its reinforced steel construction (weight, 388 pounds, empty!) provides a sturdy, steady base for vises, grinders, etc. Work top is smooth, enduring masonite. Handy outlets for power tools. Full-adjustable lamp. Big, rubber-shod wheels, two swiveling. Positive foot brakes anchor the bench securely. Durable, baked-on red enamel finish. Write for new Industrial Catalog and General Catalog of 4,000 hand and bench tools. Direct Snap-on service to industry everywhere through factory branch warehouses in 42 industrial centers.

SNAP-ON TOOLS CORPORATION
8032-I 28th Ave.
Kenosha, Wisconsin

*Snap-on is the trademark of Snap-on Tools Corporation

without a breakdown for the next two years.

The motor comes out of the truck and is steam cleaned, but may or may not be rebuilt at this time. Motors are set up on a different preventive maintenance schedule determined by the number of gallons of fuel consumption. Their schedule calls for an overhaul after 16,000 gals. This consists of a check of the fuel ignition system, reconditioning of the valves, renewal of the rings and a check of bearings, pistons, cylinder liners and crankshafts.

Time for overhaul

When the engine has burned 32,000 gals. of fuel, a major overhaul takes place. At that time the engine, including fuel injection and electrical starting systems, is completely disassembled. The engine block and its larger parts are thoroughly cleaned and checked. The crankshaft and connecting rods may have hidden flaws brought about by fatigue or strain. In order to bring out these flaws, crankshafts and rods are magnafluxed.

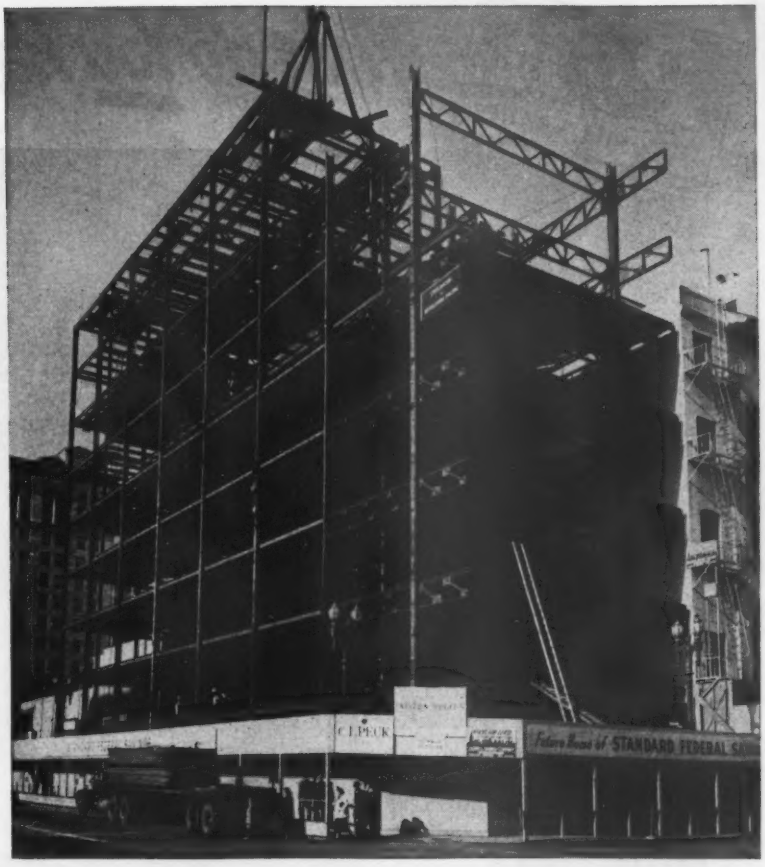
The engine is rebuilt to factory specifications, and each part is measured and recorded so that the rate of wear can be computed at the next check-up. Measurements and the name of the mechanic doing the work, along with other pertinent information, are kept on file for each engine. After complete reassembly, the engine is coupled to a cooling system and tested at operating temperatures so that any changes or adjustments can be made before installation in the truck frame.

While these larger units are being rebuilt in various parts of the shop, two men in the overhaul stall are replacing the air lines and fittings, relining the brakes and completely renewing the front end, including new or reconditioned springs.

When major units are returned they are installed, and finally the cab and fuel tank are put on the truck and wiring is completed. After a brand new paint job the reconditioned truck is ready to operate for another two years without serious road repair.

The warehouse stocks an amazing number of parts and entire major assemblies. If a rear-end transmission, engine, radiator or even a cab fails on a truck, an entirely new unit is installed in short order. However, under this new program there is only an occasional need for these items except as a result of accidents.

By adhering rigidly to this preventive maintenance program, expensive breakdowns on the road have been reduced far below the level common before this plan was instituted.



Located at Wilshire and Grand, the Standard Federal Savings and Loan Association building, when finished, will resemble a sheer block of glass. Sealed windows will extend in horizontal bands around each floor, separated by continuous spandrels of blue-gray porcelain. Interior columns have been eliminated by means of clear-span steel construction. Deadweight has been reduced with steel floor decking. *Architect:* Welton Becket and Associates. *General Contractor:* C. L. Peck.

9-STORY STEEL FRAMEWORK ERECTED IN TWENTY-NINE DAYS

Structural steelwork for this 9-story Los Angeles office building was completely erected and riveted by Bethlehem Pacific in just 29 working days. This is not necessarily a new speed record, but it is excellent time for a job of this size. It shows how this company is organized and equipped to handle large-tonnage steel construction efficiently and without costly delay to the general contractor or owner.

Bethlehem Pacific operates structural-steel rolling mills at Los Angeles, South San Francisco and Seattle; fabricating works at Los Angeles, Alameda, South San Francisco and Seattle; erection equipment depots at strategic localities along the West Coast.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

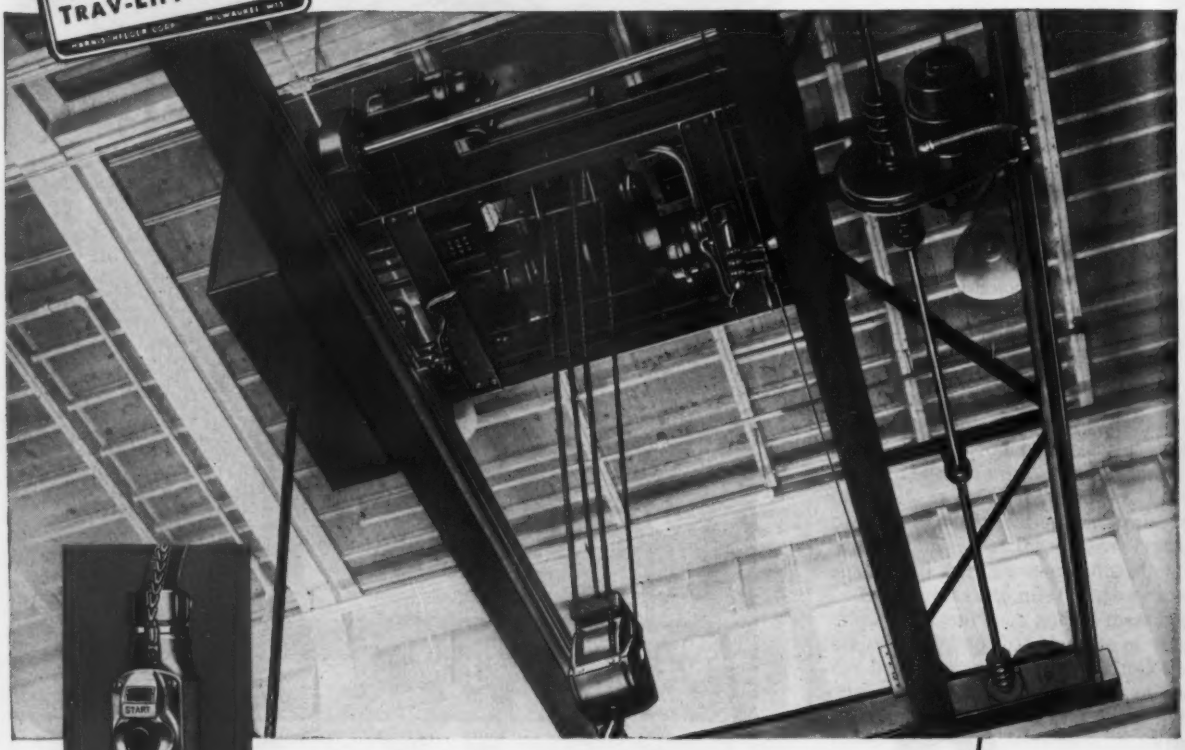
Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Spokane

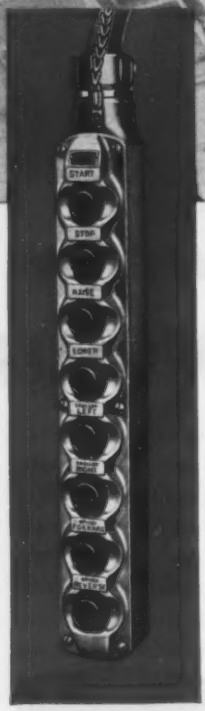
BETHLEHEM STEEL

BETHLEHEM PACIFIC

P&H TRAV-LIFT CRANES

What do You have to handle?





● Whatever it is, make the job easier and faster with the P&H Trav-Lift Cranes. Serve an entire bay with "thru-the-air" handling over congested floors. No out-of-reach spots! No rehandling. One man lifts, transports, and stores loads up to 15 tons by pressing buttons.

You save money, too, when you choose a P&H Trav-Lift. Your initial investment is lower because Trav-Lift Cranes are custom-made to your needs from standard money-saving designs. This means tailor-made service at "stock" prices.

The P&H Trav-Lift is built to meet a variety of needs . . . with either cage or floor control . . . with suitable spans and lifting speeds . . . in capacities up to 15 tons. Call P&H for expert assistance with your handling problems. Write for booklet H-13-1.

HI NEIGHBOR!

P&H Trav-Lift Cranes are made *in* the West, *for* the West. When parts or service are needed, remember, we're neighbors. Drop in and see our new Pacific Division headquarters — the West's most modern crane factory. You'll get fast, experienced help with your problems.

handle it "thru-the-air" at lower cost

P&H PACIFIC DIVISION

HARNISCHFEGER CORPORATION

Plant, District Office and Warehouse
2400 East Imperial Highway, Los Angeles 59, Calif.

Branch Offices: San Francisco, Calif., 100 Bush St., Room 212 Shell Bldg. • Los Angeles 59, Calif., 2400 East Imperial Highway • Seattle 4, Washington, 2909 First Avenue, South • Denver, Colorado, Room 415, Central Bank Bldg., 1108 - 15th St.

INTEGRATION OF JOB SHOP AND MASS PRODUCTION

By EARL E. LUND, Plant Coordinator
National Screw & Manufacturing Co. of California

ABOVE: Cut thread wood screw machines are the only ones this side of the Mississippi. LEFT: Storage areas.

PRODUCTION control problems of National Screw & Manufacturing Co. of Los Angeles revolve around the necessity of dual production operations. Both mass production and job shopwork operations must be integrated to insure high production and good quality.

The mass production items are standard bolts, screws and rivets, while the job shop produces special cold-headed products that require special operations of box milling, drilling, pointing, slotting, threading and trimming.

On a small scale the problem might seem simple, but with an average daily production approaching 3,000,000 pieces there is a real problem. Continuous flow of material from each department is essential in maintaining a production schedule and in keeping all departments operating at full capacity.

The manufacture of screws, bolts and special fasteners requires the following departments:

(1) Heading Department: Cutting the blank to the correct length and forming the type of head on the blank that is required. The header forms the Phillips recess if it is required.

(2) Slotting Department: Slotting all standard screws and some specials.

(3) Trimming Department: All cap screws and machine bolts and specials are trimmed in this department.

(4) Pointing Department: All standard bolts are pointed in this department.

(5) Slotter and Shaving Department: Slotting and shaving of stove bolts and special products.

(6) Special Pointers and Box Milling Department: Special grooving, center drill, special points like cone, dog and many others.

(7) Cut Thread Department: Cutting threads on all wood screws.

(8) Roll Thread Department: Rolling threads on all screws and special products.

"U"-shaped flow line

Basically, there are eight production departments in the shop, the flow following a "U" shaped pattern. This design facilitates production due to the elimination of excess handling. Through further shop rearrangement, handling could be further reduced if production were restricted to standard items. This, however, would cripple the diversification program.

When all of the new slotters and thread rollers are received, some changes in plant layout will be made in order to operate these machines on a mass production basis. The first slotter has arrived, and it has been set in production. It will slot six to seven times faster than any of the conventional slotters in operation at the plant.

The thread roller has not arrived, but this machine will thread six to seven times faster than the standard

PROTECTION – WHERE ACCIDENTS BEGIN

BULLARD-BURNHAM SAFETY HOOKS

At last a 100% safe hook for every type of equipment; utility and chain hoists, horizontal tuggers, come-a-longs, cranes, block and tackle or snatch blocks. Safety gate automatically locks closed and cannot be disengaged accidentally. A touch of the finger releases the lock to open gate. If the hook is sprung, even ¼ inch, gate will swing free, warning workers. All hooks used are standard drop forged hooks with B & B safety gates of non-corrosive brass. Sizes available #2 through #16A. Return spring on gate is available at additional cost. Write for descriptive circular.

E. D. BULLARD CO.
SINCE 1898
SAFETY HOOK DIVISION
275 EIGHTH STREET
SAN FRANCISCO 3, CALIF.

With gate open hook's throat is entirely free

EVERYTHING BULLARD IN SAFETY

T. M. REG. U. S. PAT. OFF.

thread rollers. Increased production from these high-speed machines would cause a handling problem if the same type of plant layout were used. Machines will be laid out in batteries, to facilitate greater production and to ease the problem of additional handling.

A majority of the orders received can be filled partially or fully from the large stock carried. The production department is responsible for the flow of fasteners throughout the plant. The backlog and the finished product reports indicate whether or not production should be increased or decreased to maintain a proper balance.

Machine breakdowns in all industry are fatal to production. In the screw and bolt industry machines are automatic and produce parts at the rate of 230 pieces a minute. A program has been established in the maintenance and repair department to remove equipment from production for overhaul. The machines are rebuilt completely and all parts that might fail in the near future are replaced to eliminate any early breakdown. Minor breakdowns often happen, but spare parts are on hand to facilitate rapid repair of all equipment.

Kardex order system

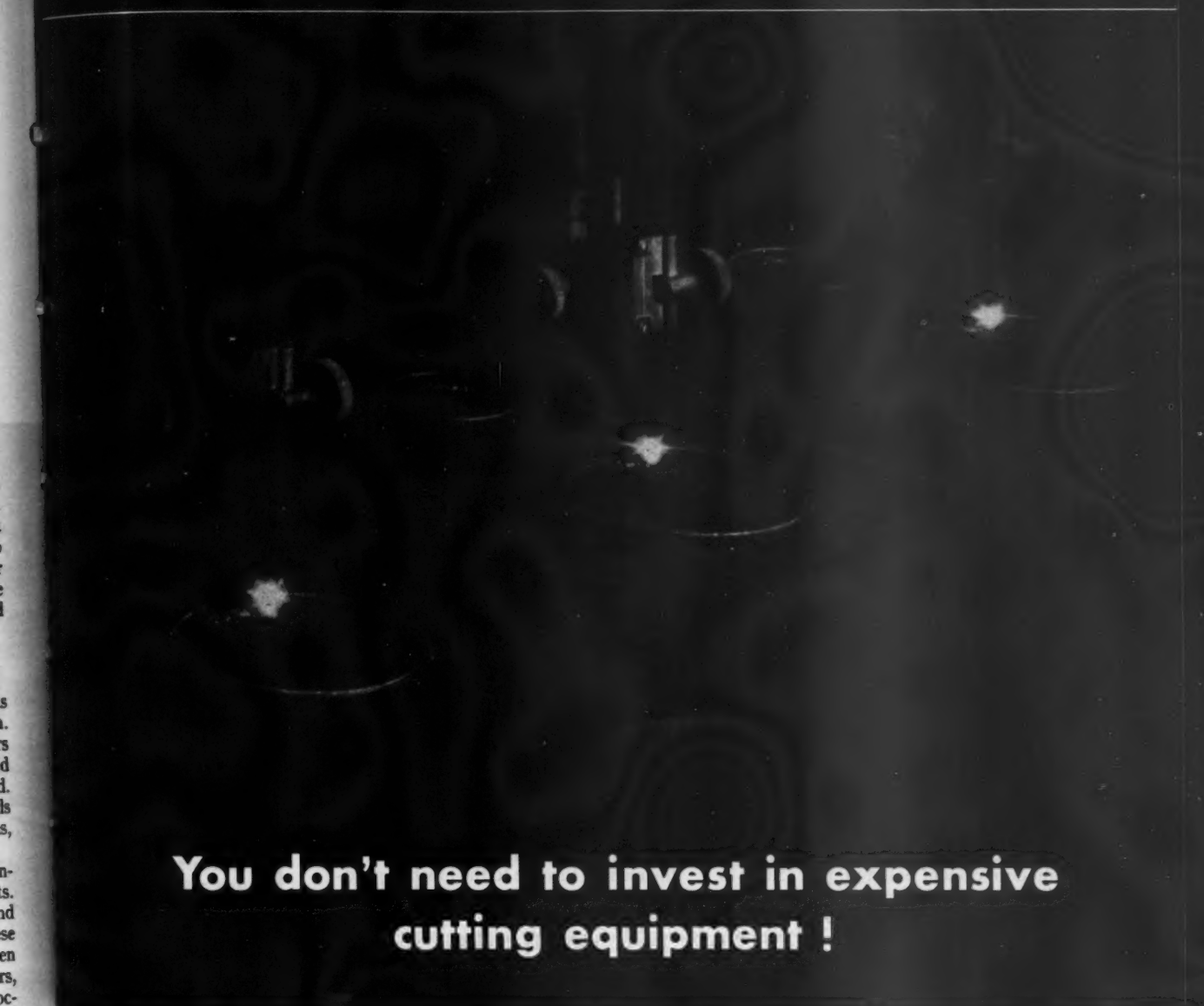
Issuing of standard mill orders is centralized through a Kardex system. Kardex personnel issue new mill orders when stock falls below a stipulated amount designated on each card. There are three colors of stock cards to ease identification of stock items, non-stock items and specials.

The Multilith system has been incorporated for all standard products. Masters then give all dimensions and necessary data to manufacture these items. Kardex personnel have been taught to fill out Multilith masters, eliminating any errors that might occur if these were individually typed. Six copies are made from a master copy on the Multilith machine, and in a few minutes a new order for the shop has been processed.

The production scheduler receives two copies of the mill order and proceeds to schedule the job for the Header department. After scheduling on a header, another copy is posted on the schedule board in the production office corresponding to the header. The order copy is only taken down from the production board when the Header department copy is marked "Completed."

Daily production weight for each item that has been processed during the preceding day is received from the posting clerk, and production records for each department are made. Fac-

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



You don't need to invest in expensive cutting equipment !

WHEN YOU BUY STEEL FROM WAREHOUSE YOU GET:

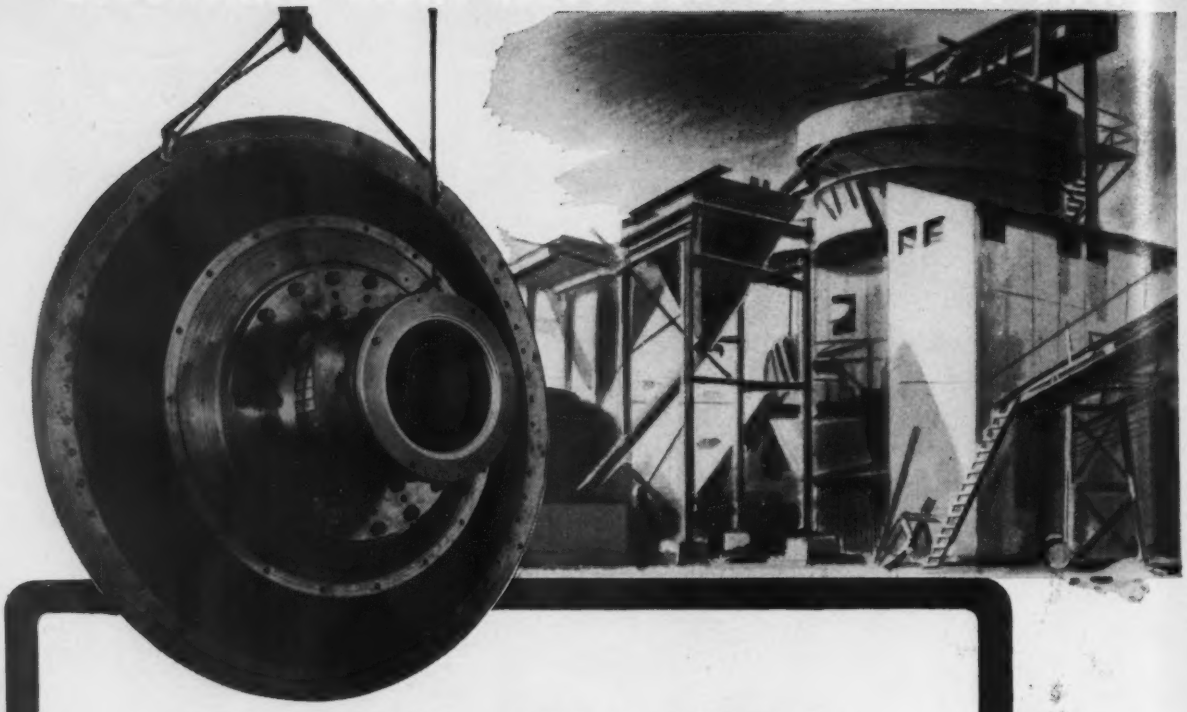
- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

TYING up money in large, expensive steel-cutting machinery is something you can avoid, if you wish. Yet you can have your cutting done on the most modern equipment available. When you order your steel from U.S. Steel Supply, specify just how you want it cut. We will meet these specifications exactly. For example, our flame cutting equipment will follow the most complicated patterns without error and turn out finished shapes precisely as you want them. Your U.S. Steel Supply salesman will give you complete information about our cutting services.

U. S. STEEL SUPPLY
DIVISION

Warehouses and Sales Offices: LOS ANGELES · PORTLAND · SAN FRANCISCO · SEATTLE

UNITED STATES STEEL



15,000 lb. MILL HEAD

for cement ball mill
cast, machined and assembled
by NATIONAL SUPPLY

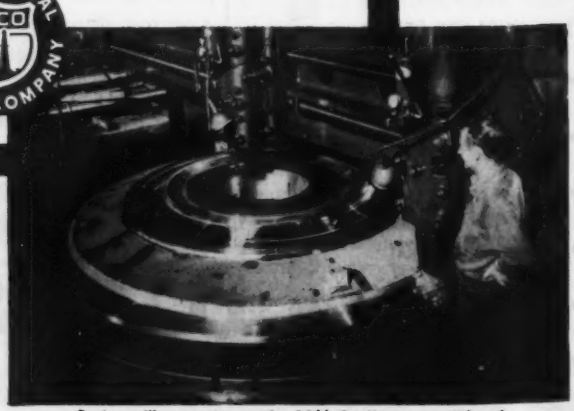
Produced for heavy-duty work in a modern cement ball mill, this 15,000 lb. mill head is typical of the integrated manufacturing and precision finishing operations performed daily at National Supply's Industrial Products Division.

The complete facilities of National's conveniently located Torrance plant serve not only the cement but many other types of industry in the western states. Whether the jobs are big and specialized or smaller production runs, National's staff of skilled workers and technicians maintains close control from the melting furnace to the finished product. The result is precision work on a large scale basis.

You'll find it worthwhile to send your tough jobs to Torrance, where the most complete facilities serve the most exacting needs of western industry.

DON'T MISS

the exhibit showing other examples of precision work from National's Torrance plant at the Western Metals Show in Los Angeles, March 23 to 27.



Boring mill operation on the 11½ ft. diameter mill head.

INDUSTRIAL PRODUCTS DIVISION

THE NATIONAL SUPPLY COMPANY

TORRANCE, CALIFORNIA • LOS ANGELES AREA

IDEAL PRESSED STEEL FORGINGS • BILLETS AND LARGE BARS
STEEL CASTINGS AND SPECIAL MACHINERY

MELTING • FORGING • CASTING • MACHINING • HEAT TREATING
ASSEMBLING • WELDING • TESTING

tory personnel receive incentive pay from these production records.

Tub card

Every mill order has a master copy called the tub card. A posting clerk records the weight and pieces that were processed on this mill order in each department. Tub cards give a full record of operations that have been completed and show the operations needed to complete the order. Slotting and thread rolling copies of the mill order are attached to the tub card to facilitate scheduling of these departments.

A copy of the mill order is taken off the tub card when the product has been headed and is given to the production scheduler, who in turn schedules the order on a machine in the next department. This procedure is carried on until the mill order has been completed.

Tooling required in every department except the headers is negligible. The Slotting department requires dials and saws, while the Thread Rolling department uses thread rolling dies. An ample supply of these are kept in stock to facilitate rapid changes and increased production.

There are no tooling problems in the Slotting and Thread Rolling departments for standard products, and very little on specials. These departments are scheduled by the same person, to incorporate the ultimate goal of high production, and to furnish the material on the promised date.

A sketch of the shop shows the relationship of various departments in the plant.

Each department must check the

Header department

work performed in its particular operation on the job. If the department completes its operation on substandard material, the cost of all operations completed is charged directly to the department completing the operation causing the rejection.

Inspectors in each department are continually checking work coming from their machines to insure high quality production. Each machine has an attached clear plastic envelope containing all necessary dimensions for manufacturing. Inspectors always check their work with this data.

High and quality production are necessary in large-scale operations, particularly in the diversified field of manufacturing fasteners. Many bolts are manufactured at Los Angeles, while the Cleveland plant furnishes nuts. These two products are manufactured 3,000 mi. apart and quality control is responsible for the fact that the bolt and nut fit when assembled.

Special mill orders are issued from the Engineering department. They contain a sketch of the special product and also the processing required in the shop to finish it. The special order specifies the tools and how they are to be made. This coordinates the tool room with the shop and facilitates production throughout the plant.

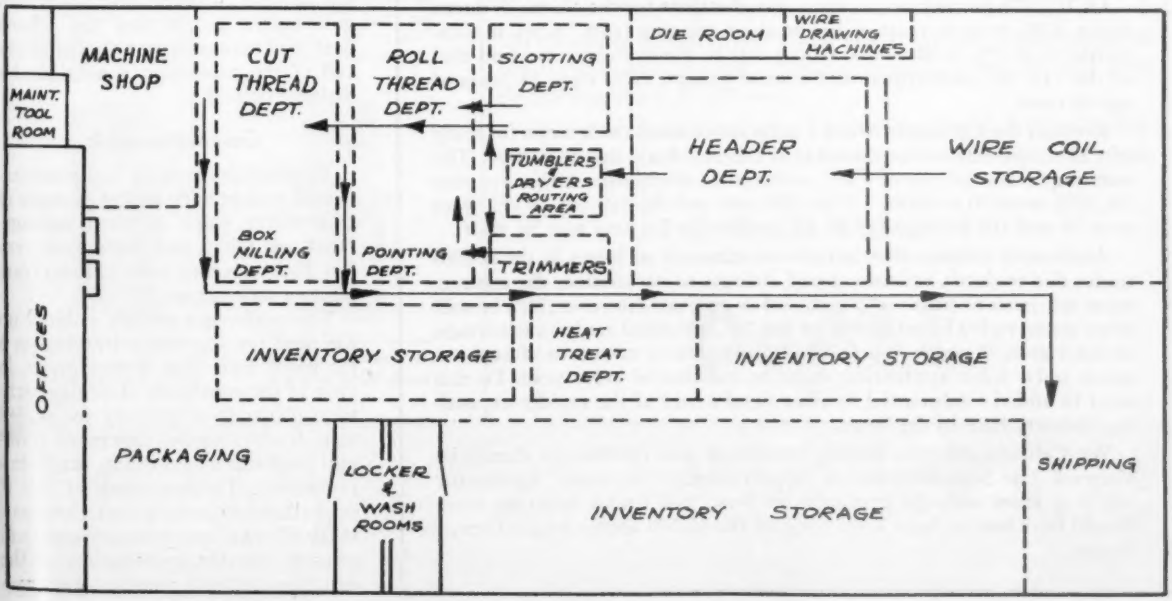
National runs many specials, the majority of which require special dies, hammers and wire. Two to three weeks are required to finish making the tools, and manufacturing must begin as soon as the tools arrive.

Travel tickets in each box of work, red for special orders and yellow for standard products, are the only identification. They show the routing, description, mill order numbers, and the amounts of the orders. Weighing of each mill order after it leaves a department is the responsibility of the production clerk, and this information is given to the posting clerk. The production clerk has a master chart showing all the codes used for the various departments, and from this information he routes the work.

The shop is arranged to handle all special products and regular products without hindering production. The flow of material starts from the headers and is routed to various departments until it becomes the finished product, as shown in the sketch.

Although inspectors in each department have the final decision on the quality of all work, machine operators do the bulk of the inspecting. Each operator must feel that it is his individual responsibility to turn out a good product before high production and good quality can be combined.

Flow-of-material diagram



APPRENTICESHIP...

...training progress is reported

CONFERENCE AT SAN DIEGO REVEALS ACTIVITY BUT NEED FOR MORE IS STRESSED

What the West faces

(As reported at San Diego by William Harold Oliver, vice president, Oliver United Filters, Inc., Oakland)

THE MOST serious thing the metal trades face is the age of journeymen in most of the crafts. Here are figures for 1950 released by the U. S. Census Bureau for the eleven Western States, covering classifications which are typical of the trades requiring "honest to God" journeymen:

Tool and die makers
Molders, metal
Machinists and job setters
Boilermakers
Blacksmiths, forgemen and hammermen
Millwrights
Foremen, manufacturing, durable goods

Of 107,826 journeymen in these classifications for the eleven Western States, 17% were 55 years of age or older, ranging from 15.5% in California to 26.4% in Montana. Going east to Pennsylvania, we find that of the 112,766 journeymen in the same groups, 22% were 55 years of age or over.

Recently the California Metal Trades Association made a careful study of 133 shops, selected at random, in the San Francisco Bay Area. The startling facts were that of 1,477 journeymen machinists, 24% were over 55, 36% were 50 or more. Of the 296 tool and die makers, 19.9% were over 55 and the *average* age of all molders in the area was 58 years.

Authorities estimate that in order to take care of losses in the skilled trades due to death, retirement and changes of occupation, the replacement rate must be nearly 4% each and every year. However, let's be still more conservative by using 3% on the 107,000 metal trades journeymen in the eleven Western States. This shows that to take care of replacements only, 3,200 apprentices must be indentured every year. To this must be added a substantial number to take care of the rapidly expanding industry here in the West.

We Californians who employ machinists and toolmakers should be alarmed. The State Division of Apprenticeship Standards' figures for last year show only 34 graduates in these two trades, whereas there should have been at least 1,380 (3% of the 46,000 shown by the Census Bureau).

THE FIRST North American Conference on Apprenticeship at San Diego in August accomplished a good deal in developing a better understanding of today's apprentice training problems, out of which may come tangible results in due time.

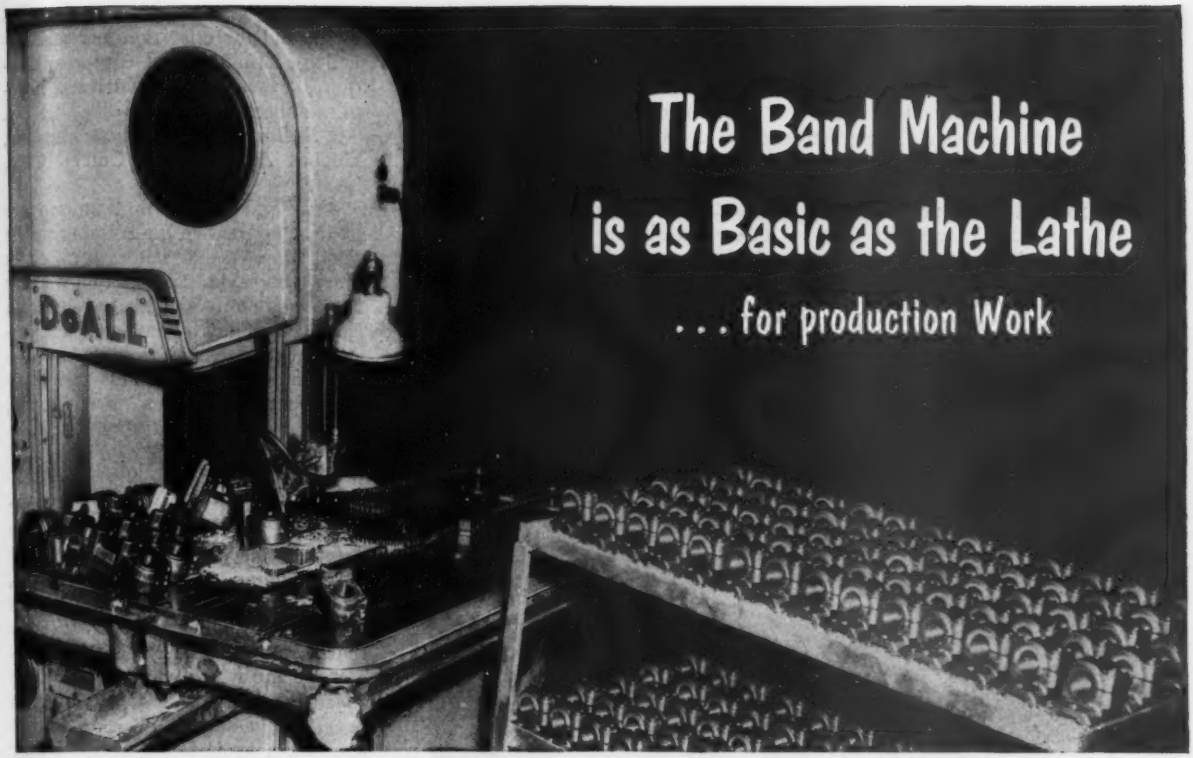
It follows two similar conferences for the eleven Western States in the postwar period held at Sonoma, Calif., and Seaside, Ore. Attendance was mostly from the West, with a sprinkling of people from elsewhere in the country and a few Canadians, but no one from nearby Mexico.

As at previous conferences, labor representatives were in the overwhelming majority, with the federal and state government people and the schools next, and management bringing up the tail of the procession a considerable distance behind.

Cooperative spirit

Despite the disparity in representation, it was an outstanding example of cooperative spirit between management and labor, and there were very few disagreements, none of them coming to a serious pass.

The conference sharply pointed up the need for apprentice training on a far wider scale than it now exists, in view of the constantly stiffening technical demands of industry for skilled men. It also revealed that many training programs could stand much improvement. Perhaps most of all, it crystallized to some extent the possibility of organized publicity efforts to promote greater appreciation of the situation by management, labor, gov-

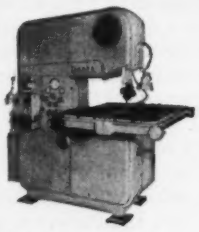


The Band Machine is as Basic as the Lathe

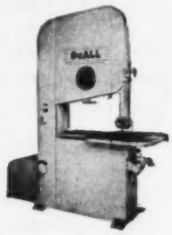
. . . for production Work

Splitting bearing castings on a DoALL Contour-matic, with a simple fixture bolted to the table. Automatic, hydraulic power feed table does the work. Operator simply puts work piece in position.

A BAND MACHINE FOR EVERY REQUIREMENT



DoALL CONTOUR-MATIC—hydraulic operation. 4 to 10,000 blade feet per minute.



DoALL ZEPHYR—up to 15,000 feet per minute. 16" to 60" throat capacity.

DoALL CONTOUR—an all around machine for precision work.

DoALL UTILITY—low cost handyman for big and small shops.

MASS PRODUCTION BAND MACHINING IS A MATTER OF SIMPLE FIXTURES

PRODUCTION costs are highly dependent on methods. Mass production band machining is a work method that has cut costs in hundreds of plants and very possibly can in yours. Slitting—slotting—stock removal prior to milling, shaping, turning and other operations—contour sawing to final shape and many other jobs can be performed almost automatically on DoALL machines with proper fixtures.

The above illustrations show three typical applications of production bandsawing. The opportunities are limited only by the ingenuity of the user.

To lower costs, investigate bandsawing. ASK FOR LITERATURE. Call your local DoALL Sales-Service Store, or write:

THE DoALL COMPANY
254 N. Laurel Ave., Des Plaines, Illinois

DoALL

B-19

ernment, schools and the general public.

Accompanying figures cited by William Harold Oliver of Oliver United Filters give a significant picture of the West's needs. Other reports along the same line are as follows:

"Of the 300,000 journeymen that have entered California in recent years, only 30,000 of that number have become journeymen through apprentice training programs"—Charles F. Hanna, assistant chief, Division of Apprenticeship Standards, California Department of Industrial Relations.

"The line between the skilled craftsman and the engineer is becoming thinner all the time"—J. A. Olmer, training supervisor, Boeing Airplane Co., Seattle.

"In modern military aircraft the trend is toward highly precise and intricate electronic devices which make flight and control of weapons relatively automatic. The equipment and processes with which we manufacture these products are constantly changing and threatening our limited resources of high calibre skill. This is equally true in guided missiles.

"The capital machine tools to produce these products have themselves undergone an evolution of development, and the operation and maintenance of this type of equipment requires a level of skill which has heretofore been undeveloped"—W. G. Tuttle, director of industrial relations, Hughes Aircraft Co., Culver City, Calif.

"The sad fact is that unions are limiting apprenticeship training to the point where some midwestern cities are virtually destitute of tool makers . . . Local reports indicate the situation is worsening day by day . . . The present old-timers can't live forever"—From a survey of business paper editors reported on by A. C. Prendergast, editor of *Western Industry*.

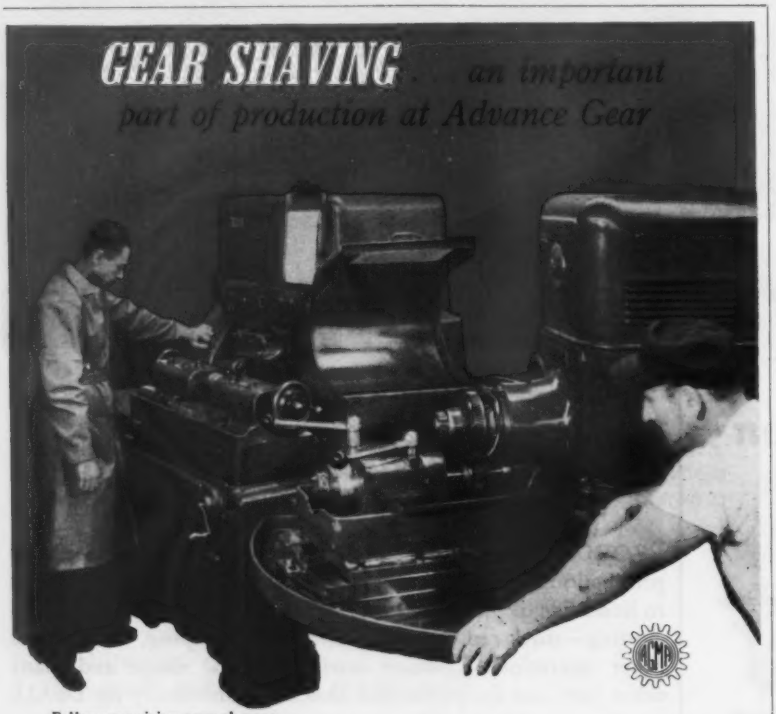
Big selling job

It soon became obvious to anyone attending the conference that there is a big selling job ahead, to educate management, labor, government, schools and the public. This involves not only convincing the youth of today that the "blue collar job is just as important and worth while as the white collar job," as one of the union men put it, "but also to convince them that it is worth while to spend up to four years as an apprentice at comparatively low pay when higher pay jobs are available immediately without any training."

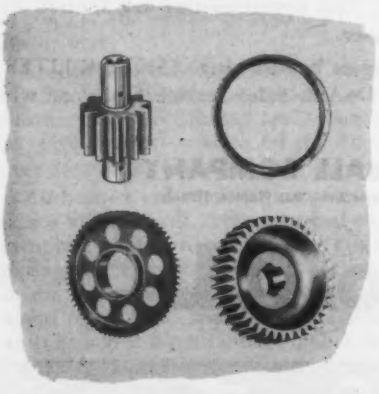
As for management, "it is taking the least part in apprenticeship training when it has the most to gain from an efficient workman," said Roderick A. Smith, Los Angeles, of the P. J. Walker Co., builders.

The survey of business papers previously referred to indicated that there has been no serious effort by management to see that the subject is given adequate attention in such magazines.

Discussions revealed that management is frequently apprehensive that



Fellows precision gear shavers with capacity to 12" diameter external or 18" diameter internal and 4 diametral pitch.



Precision is the watchword at ADVANCE. In gear shaving, the most widely used, and one of the fastest methods for finishing of spur and helical teeth, only the most modern equipment is employed by ADVANCE craftsmen to make sure that precision gears are produced. ADVANCE craftsmen are thoroughly familar with every method of gear shaving employed in the gear industry, as well as other techniques in gear finishing. You may be sure that any gear problem you have will be quickly and correctly solved by ADVANCE facilities.

Call us for engineering assistance and information.

Advance Gear & Machine Corp.

5851 Holmes Ave., Los Angeles 1, Calif.

ROOFING is supervised by men of experience, speeding apprentice's training.

HERE ARE THE LATEST DEVELOPMENTS ON MATERIALS PUMPING SYSTEMS

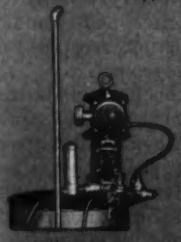
Lincoln's **new Catalog 40 provides a mine of information on the latest in Power-Operated Pumps and Accessories for Spray or Flow Application of Materials from Fluids to Heavy Viscous Compounds.**

Write today for your copy of Lincoln's new Catalog No. 40

These new Lincoln heavy duty Pumping Systems provide a job-proven method for faster per-minute application of material, through hose or pipe lines, direct from original container to point of application.

When you invest in a modern power-operated Lincoln System you **automatically eliminate** the many cumbersome, profit-sapping operations inherent in conventional methods of application, such as:

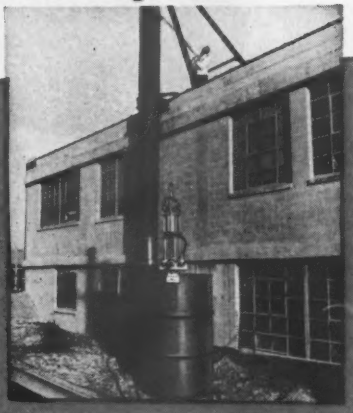
transferring to smaller containers
costly transporting
installing bung valves
delivering to machines
stopping machines
use of manual applicators
waste of materials
materials skinning-over
charge-backs for inadequate application
product spoilage
excessive consumption of valuable floor space



Model md-1
Pale Gun System

Model md-7
Flow Gun System

Model md-3
Spray Gun System



Spray time for applying such materials as Rust Preventives can be cut as much as 50% with a Lincoln Power Dispensing System.

Lincoln Pumping System used to apply Mastic Sealer to refrigerators.

WHETHER YOU'RE SPRAYING insulating materials, waterproofing or protective coatings, lubricants or fine finishes; or if you're applying mastic sealers, adhesives or caulking compounds, a Lincoln Power-Operated System will quickly refund its cost by effecting savings in many plant operating categories, *as long as it is used.*

• • • PIONEER BUILDERS
LINCOLN
LUBRICATING EQUIPMENT • • •

Lincoln Materials Dispensing Systems are available through leading Industrial Distributors Coast-to-Coast

LINCOLN ENGINEERING COMPANY OF CALIFORINA • LOS ANGELES, 2944 S. Grand Ave. • BERKELEY, 3033 San Pablo Ave. • PORTLAND, ORE., 1019 S. E. 8th Ave.

The fork truck that gives the most service

is the one that

GETS THE BEST SERVICE

That's why Clark Equipment western dealers provide the finest service in the materials handling industry . . . and put that service within reach of every Clark user on the West Coast. Here's what it includes:

PREVENTIVE MAINTENANCE: Periodic inspection of your equipment so that needed repairs and replacements may be made during slow periods. This is excellent insurance against costly breakdowns during your rush season.

REPAIRS and OVERHAUL: Our service men are factory trained . . . skilled and experienced in handling even the most complex repair or overhaul job. And they'll take a genuine interest in your problems and their solution.

REPLACEMENT PARTS: We carry a large stock of genuine Clark parts to handle almost any situation without delay. In emergencies, parts can be shipped from the factory within 48 hours.

Here's service that serves . . . service with a conscience . . . service that's equalled only by the Clark line itself . . . the finest line of fork lift trucks, powered hand trucks and industrial towing tractors.

Note the eleven locations shown below. . . strategic locations for maximum service to western industry. Pick the one nearest you . . . and call Clark.

CLARK MATERIALS HANDLING EQUIPMENT

Sales and Service

ROBERT H. BRAUN COMPANY • Los Angeles 22, California
Fresno, San Diego, Bakersfield • Phoenix, Arizona

GLEN L. CODMAN COMPANY, INC. • Oakland 3, California

PRESTON FALLER COMPANY • Seattle and Spokane, Washington

AN APPRENTICE works on a chesterfield set as a part of his experience as an upholsterer under the upholsterers' joint committee.

participation in apprentice programs will result in increased union restrictions. Also there is the fear that other employers will hire away the trainees.

Some fears about union encroachments undoubtedly were quieted by encouraging reports from employers who have had experience with apprenticeship. As for training a man who will take a job elsewhere, there was much reassurance in the words of Harlan A. Arthur, supervisor of the trade and technical training section of Ford Motor Co., that 50% of their trainees stayed on, while others came back eventually. His company regards training as an investment, to be made rain or shine.

Unrealistic criticism

Criticism of federal and state programs as unrealistic was another feature of the business paper editor survey by *Western Industry*, indicative of a need for a better understanding of what these programs are, plus varying needs for improvement.

While the schools should be steering a big flow of youngsters into apprentice training, it was evident that the counselors in the schools who are responsible for guidance are woefully ignorant on the subject and are inclined to steer everyone toward white-collar work. A good example of remedial action is that of Boeing Airplane Co., who circulated a leaflet "Facts about Apprenticeship" in the high schools, with a highly gratifying response. Another is an 8-page booklet by the State Division of Apprenticeship Standards of California, entitled "Learning a Trade is Like Putting Money in the Bank—It Pays Big Dividends."

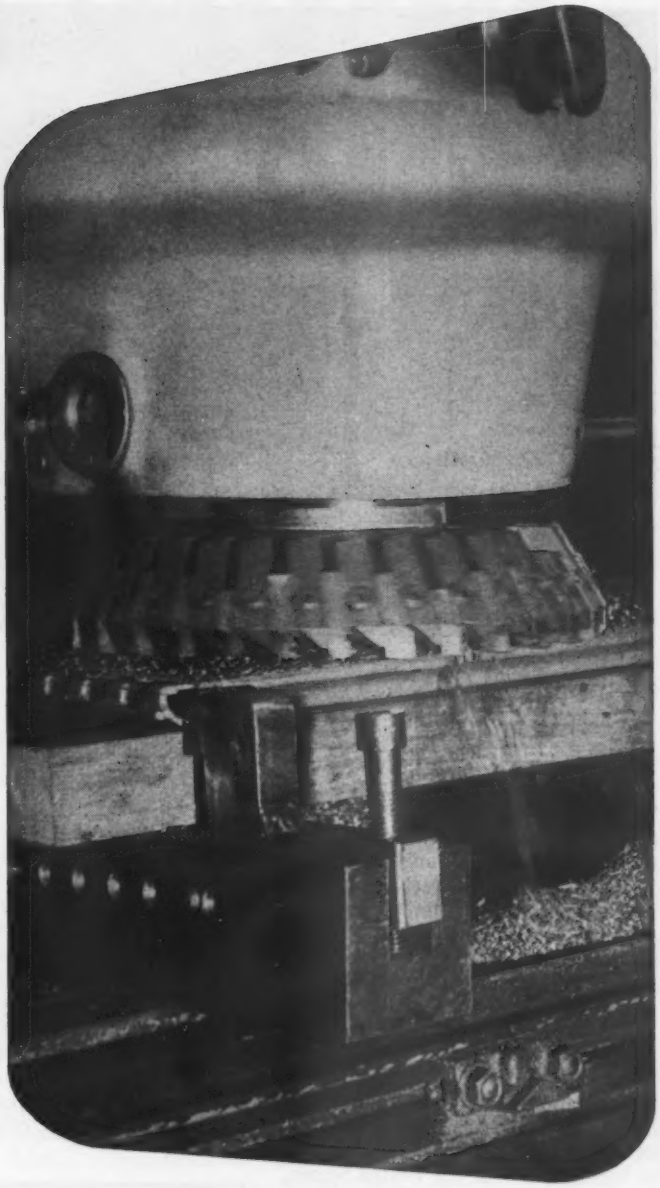
Even among craftsmen themselves,

A WEEK'S FINISHING DONE IN A DAY

HAYNES STELLITE alloy milling cutter blades recently solved a tough finishing problem in the production of cast iron mold jackets. Face-milling operations with harder tool materials failed because of chipping and spalling of the cutter blades after finishing only a few castings. Then the foundry tried grinding the jackets. But this was too slow; it took at least 30 minutes to grind each one.

A switch to HAYNES STELLITE Star J-Metal blades cut finishing time to a mere six minutes per casting. An extra saving results from the long life of the HAYNES STELLITE alloy blades. They produce about 350 pieces per grind.

HAYNES STELLITE alloy tools are ideal for cast iron milling jobs because of their high compressive strength at cutting temperatures, good impact strength, and extremely low coefficient of friction. Contact our nearest District Office for on-the-job help with your machining problems, or write for the new manual, "HAYNES STELLITE Metal-Cutting Tools."



This 12-in. diameter cutter, containing 32 HAYNES STELLITE alloy inserted blades, removes 1/16-in. of stock from cast iron mold jackets. A 36-in. casting is milled with this setup in about 1/5 the time required for grinding.

HAYNES alloys
TRADE-MARK

"Haynes" and "Haynes Stellite" are trade-marks of Union Carbide and Carbon Corporation.

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

TOOL AND DIE makers have organized one of the more active apprenticeship programs in the West. Experience shows that apprentices do a better job and learn faster when under the direct supervision of highly trained journeymen.

it was said, there was too great a tendency to urge their children toward professional occupations. Mrs. P. D. Bevil, of Sacramento, president of the California Congress of Parents and Teachers, pointed out that much influence in the right direction could be exerted on mothers through the PTA.

The apprentices themselves could be made good salesmen for apprenticeship, reported a trainee from Fresno, who said he had very little appreciation of its value until he got into a course. He thought apprentices should be sent around to the schools.

Remedial action

Joint apprenticeship committees of labor and management, widely known as "JACs," are doing an excellent job, in various parts of the United States and Canada, in conducting training programs and encouraging acceptance of the idea, judging by the reports given. Here are a few samples:

San Bernardino and Riverside Counties (Calif.) Printers JAC is interviewing high school seniors regarding entrance into apprenticeship, with the school coordinator working to improve counseling services for students in the ninth grade and above regarding the printing trades.

Ford Motor Co. has a JAC at the Rouge Plant which is the central committee for all apprentice programs in the company.

The railroads and their unions have JACs to review existing programs and improve them.

Alameda and Contra Costa counties, Calif., have a highly successful JAC with both AFL and CIO represented on the labor side.

The federal government and many states have laws encouraging JACs. The U. S. Department of Labor was authorized in 1937 to set up an Apprenticeship Bureau. Thirty-one states now have apprentice agencies.

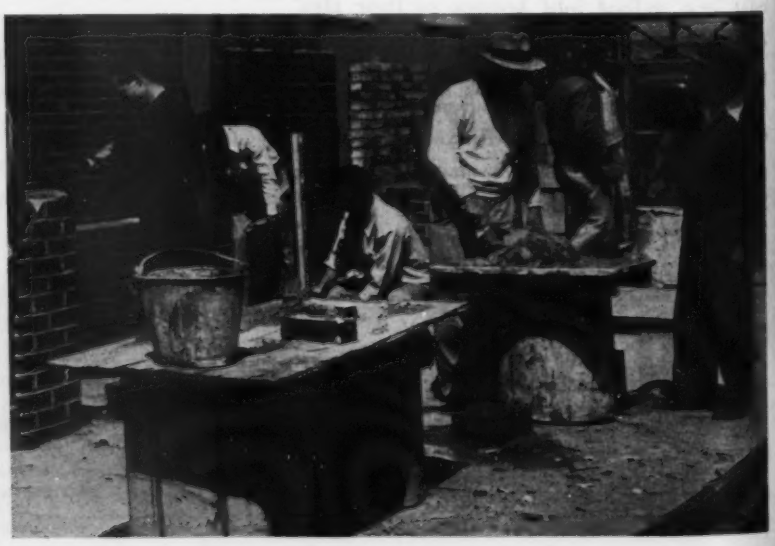
Mass graduation exercises from apprentice courses sponsored by JACs are held here and there. One of them took place on banquet night at the San Diego conference, the graduates coming not only from the San Diego area but Los Angeles, other Southern California points, and Phoenix and Tucson in Arizona.

Pools of small employers who are unable to carry on programs by themselves were discussed. In some areas—Alameda and Contra Costa counties, Calif., and the state of Washington—rotation systems have been set up, with the JACs deciding when apprentices should be transferred from one shop to another.

Union representatives reported some inertia among unions about changing ratios to meet today's needs. In San Francisco any employer who has proved his interest in an apprenticeship can get his ratio changed.

A session of national, state and local JACs resulted in agreement that there is a definite need for a standard work record that can be transferred when the apprentice moves within the state or to other states. The machinists union in Washington has such work records which could be transferred to other states.

For isolated apprentices, Canadian delegates reported their current solution, that groups of apprentices are brought together at a school for a definite period of time, perhaps a month, the government paying them a minimum amount while attending school. An apprentice will attend several of these sessions during his indenture. In Washington there is supervised home study for three weeks out of a month by a journeyman in the area, coupled with one week of the month devoted to classroom sessions.



BRICK-LAYING apprentices work at a variety of jobs, giving supervisors an excellent opportunity to evaluate progress of each.

PRE-TESTED TOUGHNESS FOR *Torture* DRIVES

PRE-CHECKED HARDNESS PROVES EXTRA WEAR IN ATLAS ROLLER CHAIN

Grueling . . . rugged shock loads . . . day-in day-out poundings on the roughest drives—Atlas Roller Chain has the pre-tested, proven toughness to take them all. Longer trouble-free production for you is proved by repeated Rockwell Hardness Tests of every important part of Atlas Chain. The toughness that gives greater strength and wear resistance . . . built in by the exclusive Atlas hardening process . . . is scientifically checked and re-checked. Result . . . ruggedness for every drive . . . smoothness for positive power.

The pre-tested toughness of Atlas Roller Chain lets it take a beating, stand up longer. That means lower maintenance and fewer replacements, greater production and higher profits.

For full rated speeds on all your machines, under any operating condition, install Atlas "Super-Life" Roller Chain—the chain with the extra stamina. Write today for the new Catalog and Handbook on Atlas Chain.

See Your Local Atlas Distributor for Quick Deliveries . . . Service

ATLAS CHAIN & MANUFACTURING CO.
PHILADELPHIA 24, PENNA.

ATLAS

ATLAS ROLLER CHAIN

READING room of the Bethlehem Pacific Library, showing the main entrance and working area. Room is used both for recreational reading and reference work. Leading trade and business magazines are displayed on racks, behind which are storage bins which hold a year's file of publications.

YOUR COMPANY LIBRARY—

MODERN BUSINESS and industry is becoming increasingly aware of the value of a company library as an important management service. Today's executive requires a far broader knowledge than in the past, not only of his own products and services, but of the over-all economic factors affecting his buiness. The company library provides a logical, practical and convenient source for the information he needs.

Success of the company library however, depends largely on management's active interest and participation in making known the type of material which would be of greatest value to the specific needs of the departments served. Management cooperation is essential to the development of a well organized, coordinated and effective company library.

Often a jumble

In too many cases the business or industrial library, if it exists at all, is little more than a glorified storeroom for a haphazard collection of books, periodicals and other material, which may or may not have any bearing on the specific reference needs of the company. A little over two years ago the management of Bethlehem Pacific Coast Steel Corporation decided to put into effect a program for the organization and expansion of the library services to fit the needs of all departments.

That there was a need for a centralized source of information and reference was readily apparent. Every department had frequent occasion to obtain data on economic, industrial, financial, marketing or technical subjects related to or affecting the company specifically and the Western steel industry as a whole.

Research and reference work for reports, papers and speeches required for departmental use had to be developed by an individual in the department. This quite naturally took that individual from his regular work and resulted in more man-hour requirements for the department. A survey also showed unnecessary duplication in the book and periodical collections maintained by the various offices.

It was to eliminate this duplication and to effect a substantial saving in time and effort expended in research and development of information that the library expansion was planned.

The first step was to determine the type of material most often required by each department and to this end a survey of the entire company was made. At the same time lists of all books in all departments throughout the company's offices in San Francisco, Los Angeles, Seattle, Alameda and Portland were obtained and indexed in the library's alphabetical catalog. The same procedure was used in listing and indexing magazines and periodicals.

Coordinating catalog

These listings, added to the nucleus of material already on hand in the library, provided a fairly substantial catalog as a basis for coordinating the library services. Where books or other material in departments were not needed for frequent reference, they were added to the library collection. In other cases, as in the technical libraries at South San Francisco and Los Angeles plants, it was agreed that these books would be available for loan through the central catalog in the library but would be permanently kept at the original source.

At the completion of the survey and the cataloging of outside books, the type of material and service which should be available through the library was fairly well established. The pri-

mary need was for an industrial and economic reference library with emphasis on the steel industry and the Western States served by Bethlehem Pacific.

In addition, material on shipbuilding, ship yard activity and shipping operations was needed, as the library would also serve the shipbuilding division of the company. A foundation of basic technical reference works was planned, although the technical libraries at the steel plants solved a major problem in building up this section of the book collection.

Initial selection

There is a tendency in developing a book collection for a specialized library to acquire too many books at the outset in an effort to cover the field as thoroughly as possible, or sometimes just to fill empty shelves. To avoid this danger, Bethlehem Pacific Library purchased all of its first new books through bulletins giving brief reviews of proposed additions which were sent to department heads and executives for their selections.

This method was discontinued after a time, but new books are still added on the basis of demand or where it is felt that they will provide a valuable reference source. In the first two years of operation Bethlehem Pacific through purchase increased the library collection by only 600 books. The entire catalog however, which included all company books previously on hand, numbers somewhere around 3,500.

In a library of the type developed by Bethlehem Pacific, organization of the reference material is of equal if not greater importance than the book collection. Much of the material needed must be obtained from special reports, papers, magazine articles, trade directories, and publications of civic, trade and technical associations.

Vast quantities of such material turns up in a library. It must all be sorted, evaluated and disposed of in one way or another. If it has any possible importance as a reference source, it is kept. A great deal of the reference material at Bethlehem Pacific is company-published.

The library maintains a complete file of all technical papers and articles written by company officials, as well as an index of current technical articles from various periodicals which is issued weekly by the Research Department of Bethlehem Steel Company. The library also keeps copies of all Bethlehem Steel and Bethlehem Pacific catalogs, booklets and product advertising folders.

Reference system

To simplify cataloging of reference material, Bethlehem Pacific Library set up its files by subject heading, indicating the general contents of each file on a catalog card. The file itself contains general information on the subject, papers, clippings and reports, and a bibliography of additional material available through the library, as well as a list of outside reference and research sources. The file also contains a list of those company executives or departments particularly interested in the subject, and as new material is received it is routed to these offices for their information and returned to the library.

The knowledge and use of outside sources is an important function of the industrial library. It would be impossible to have material on hand to cover all of the inquiries which come to the library. Any company library, although it may specialize in one field generally, receives many inquiries for information which must be obtained on the outside. At Bethlehem Pacific Library at least 50% of all inquiries require outside research in whole or part.

There are many outside resources available which are not difficult to find. The most valuable perhaps to the industrial library is its membership in the Special Libraries Association, which is a national organization with active regional chapters. The membership is most cooperative in interchange of material and information. Other important sources aside from business and public libraries are the many civic, industrial, professional and government agencies and associations.

One of the most important sources of material in an industrial library is through the trade magazines and periodicals serving the fields the library may cover. At Bethlehem Pacific the library receives and circulates to company executives 150 trade and business magazines, periodicals and newspapers. These are all checked for clippings and articles to augment the reference files. Periodical indexes are also valuable in developing reference material, as are various publications which list and describe sources of business, technical and economic information.

—Its usefulness depends on good organization rather than on its size

Promoting usage

The planning and organization of a company library may be highly efficient but a wasted effort unless the library's services are known and used by those it is designed to serve. The problem of promoting the library, to advertise its facilities and services and to maintain interest and participation, is no different than any other enterprise.

At Bethlehem Pacific the library is a part of the Publications Department, which is in itself a service department and which brings considerable traffic to the library. It was discovered, how-

A SECTION of the magazine racks, showing the interior of the bins for filing of back issues.

ever, that this feature, although helpful, was not enough to make the library's services fully known.

Library bulletins have proven a most reliable method of acquainting company officials and personnel of the services available. Periodical bulletins are sent to individuals throughout the company, listing abstracts of current articles and papers, reviews of new books available and innovations in library facilities.

Book jackets shown

Bulletin boards also post jackets of new books and any news of interest regarding the library. In the beginning, the bulletins were issued twice a month and after the first year this was cut to once a month. At present, with the increased volume of activity in the library, bulletins are brought out on a bi-monthly schedule.

Now in its third year of operation, Bethlehem Pacific Library is seeing the results and effectiveness of its organizational program. The two prime factors, determining the need and assembling the material necessary to serve that need, have been accomplished.

To company offices in San Francisco, Los Angeles and Seattle districts, the library offers a centralized and coordinated reference and research service, together with a comprehensive collection of books and periodicals. In addition it has proved useful as a public relations service in its contact with other industries and organizations through exchange of library inquiries and supplying information to other companies.

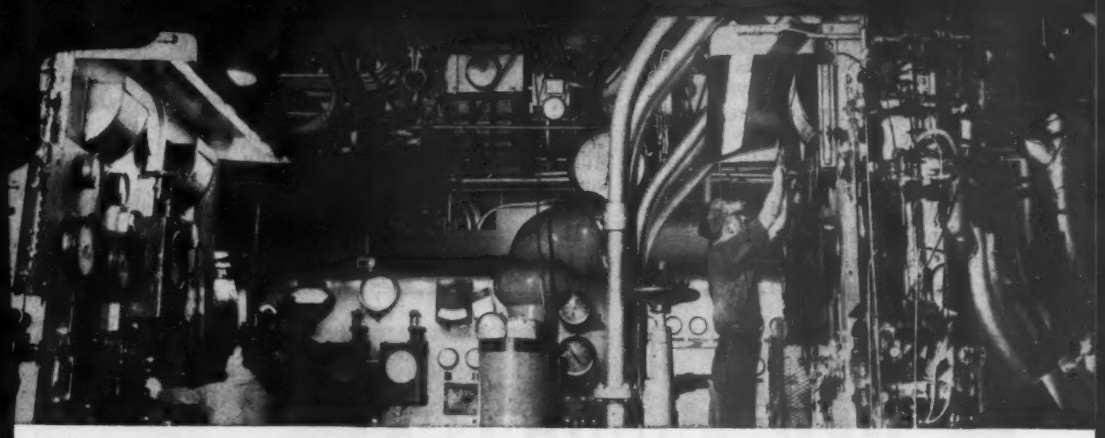
Partly as a personnel service and partly to stimulate library traffic, a recreational reading section was established with the facilities of a reading room and circulating library. As an employee relations feature it has been very popular, possibly due to the fact that Bethlehem Pacific's general offices in San Francisco, in which the library is located, are in an industrial district where there is little opportunity for recreational facilities. It has served its purpose also in acquainting a larger group with the library's reference services.

Small but solid

Bethlehem Pacific Library is not large in comparison with some of the industrial libraries in the area and it is not intended that it should be. At present it includes three units; reading room where current magazines and periodicals are available, librarian's office which houses the book and reference sections, and a recently enlarged storeroom for permanent files of magazines, periodicals and other material.

The library staff consists of one librarian and part time assistance from members of the Publications Department staff. It is felt that by keeping the library on a small scale its services will be more personalized and better integrated. However, it has outgrown its quarters twice in two years and there is no indication at the moment that it is about to stop.

VIEW of Bethlehem Pacific Library, looking from the book room and library office and showing a section of the book shelves and newspaper filing cabinet.



STOP COSTLY PIPE-LINE FAILURES

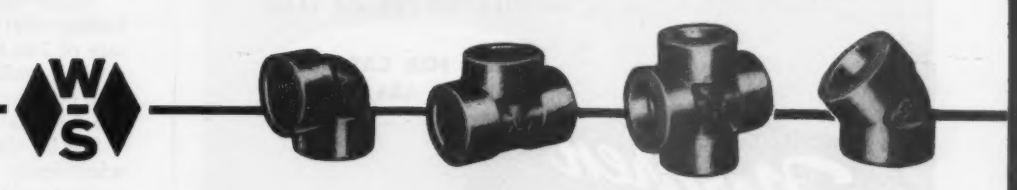
No one knows better than you the increasingly high cost of unscheduled outages due to pipe-joint failures. But do you know just how far it is possible to go toward *eliminating* such failures throughout the life of your piping systems? The answer to this critical problem in production and maintenance costs is FORGED STEEL FITTINGS by the pioneer firm of Watson-Stillman—consultants and suppliers to *all* major industries concerned with pipe joining and maintenance.

Watson-Stillman fittings are FORGED for maximum strength, toughness, and resistance to corrosion, vibration, and shock. More uniformly precise in all dimensions, they are the modern go-between wherever pipes meet permanently.

Leading Refineries, Chemical Plants, Public Utilities, Refrigeration and Industrial Plants throughout the world stay on stream at lowest cost-per-year with the famous Double-Diamond Fittings by Watson-Stillman. Write for literature.

Screw-End and Socket-Weld Types

SOLD THROUGH LEADING DISTRIBUTORS



WATSON-STILLMAN FITTINGS DIVISION

H. K. PORTER COMPANY, INC.

136 ALDENE RD., ROSELLE, NEW JERSEY

9-0-5

NEW CART
cuts assembly costs

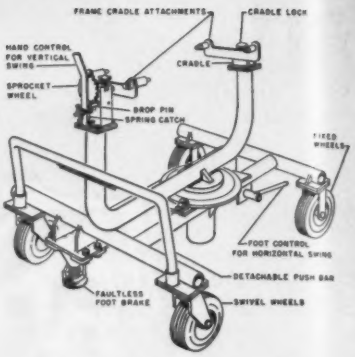
ASSEMBLY of gas turbine compressors by AiResearch Manufacturing Company has been streamlined at its Phoenix, Arizona, plant by a newly designed assembly cart.

The compressors, hearts of the auxiliary pneumatic power systems for jet and turbojet aircraft, are carried through the entire assembly process, test labs, and final inspection to the shipping room on a sturdily built, light weight cart easily handled by one man.

Design of the cart makes it possible for assembly workers at each line to remain conveniently close to their tool bench and small parts trays while working. By a hand control, the worker can rotate the unit being assembled, vertically through 360 degrees geared to stop on increments of 15 degrees.

Foot controls enable the unit being worked on to rotate horizontally through 360 degrees stopping wherever the operator chooses. At each assembly point, the cart itself is secured to the plant floor by a faultless foot brake which stops any cart or assembly movement during torque actions on the engine assembly.

The cart is mounted on four 8 x 2.50 zero rubber pressure tires. The two front wheels are fixed and the rear two are on swivels enabling the cart to make a small turning circle.



The initial sub-assembly compressor frame, though bulky in shape, is easily loaded on the cart at number 1 assembly point by two men. When setting the initial frame into the open cart cradle, only a slight pressure on the hand control is needed to trigger off the spring catch. This allows a holding pin to drop by the force of gravity into the sprocket where it is easily locked in place.

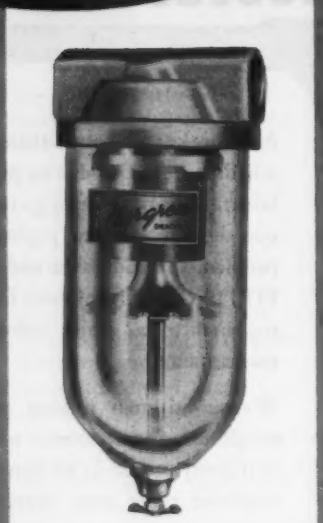
This spring catch arrangement eliminates the need of a third man. Initially designed models required a man to open and hold the cradle latch while two men loaded the unit.

Dust free transportation of newly assembled compressors to the test area is assured by zippered canvas covers which are easily slipped over the test bound units. All testing facilities are standardized to the height of the assembly carts. Test proven units are checked by final inspection before being wheeled to shipping.

The new assembly cart saves operator fatigue and insures damage-free transit of the delicate mechanisms.

NEW NORGREN

TRANSPARENT BOWL FILTERS



Now, more efficient ¼", ⅜", ¾" and 1" sizes.

AUTOMATICALLY removes corrosive moisture and abrasive foreign matter from compressed air lines.

FLOW: ¼" and ⅜", 0 to 30 cfm. ¾" and 1", 0 to 140 cfm.

PRESSURE: to 150 psi.

TEMPERATURE: 40° to 120° F.

FILTER ELEMENTS: standard: reinforced 200 mesh monel wire screen (74 micron). 25 and 64 micron sintered metal filter elements available.

PIONEER AND LEADER IN OIL FOG LUBRICATION FOR 25 YEARS

WRITE FOR CATALOG SHEETS 486, 481.

C. A. Norgren CO.
3433 So. Elati St., Englewood, Colo.

VALVES • FILTERS • REGULATORS • LUBRICATORS • HOSE ASSEMBLIES

ENGINEERS
learn to read

THE ENGINEER shortage problem has caused Minneapolis-Honeywell Regulator Co. to institute reading classes to make better use of the available talent.

Nation-wide tests indicate that top management people read at an average rate of 250 words a minute, which is seventh-grade level. Engineers tend to read even more slowly, averaging some 207.8 words a minute.

Special classes were introduced to scientifically cultivate more rapid reading and better understanding. Results showed an increase in reading speed to 410.3 words per minute, with a comprehension increase from 65% to 69%. The program's value as a labor-saving idea is considerable.

CHASE®

free-cutting brass rod

means longer life for your tools

Chase Free-Cutting Brass rod yields short chips as it is machined. The result is much easier cutting, longer tool life. Products produced are smoother, cleaner-surfaced, less expensive to buff or polish before lacquering, enameling or plating.

Fine quality Chase rod and drawn bar are available in a wide variety of free-cutting copper alloys. They are always uniform so that repeat orders have the same cutting characteristics.

For rod and bar, for finer products at lower unit cost, call the Chase warehouse nearest you.

Chase BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

• The Nation's Headquarters for Brass & Copper

LOS ANGELES 54, CAL. • 210 S. Central Ave., Tel. MAdison 6-0101
SAN FRANCISCO 7, CAL. • 680 Second St., Tel. GArfield 1-7780
SEATTLE 4, WASH. • 1957 First Ave., South, Tel. SEneca 1862
DALLAS 2, TEXAS • 119 Pittsburgh St., Tel. PRospect 4271
HOUSTON 1, TEXAS • 16 Drennan St., Tel. CApital 7266
DENVER 2, COLO. • 1706 Welton St. at 17th St., Tel. AComa 3685

Built to be Reliable Whenever Emergency Service is Needed!

Be prepared to fight fire at the start, with hose you *know* will be ready for the emergency . . . sound and strong after long periods of disuse.

GOODALL FIRE HOSE

Backed by 83 years of hose-making experience . . . as perfect in quality as it is possible for skilled craftsmen and modern manufacturing equipment to produce. Made in a variety of constructions to meet every situation or preference. Three types widely used for industrial plant protection are described below.

COTTON RUBBER LINED

Single or Double Jacket

Jacket is made of selected long-fibre, long-lasting cotton duck, providing exceptional resistance to snagging, puncturing, bursting. Rubber lining is tough, durable, carefully cured. Flexibility and relatively light weight assure easy handling and coiling. All standard sizes.

"LONG LIFE" BRAND . . . Wrapped Duck Construction

A 400 lb. test pressure hose especially designed for chemical plants, oil refineries, terminal and bulk plants and other installations where chemicals, solvents or mildew would quickly deteriorate Cotton Rubber Lined hose. Excellent flexibility. Coils flat on the reel. Outstanding in durability and safety. Rubber or synthetic cover. Sizes 1½" to 2½".

UNDERWRITERS UNLINED LINEN . . .

Another Goodall fire hose of proven reliability. Made from pure long line flax fibre, it is light in weight, easily handled, and can be stored in a small space. Designed especially to provide maximum resistance to deterioration resulting from infrequent use. Sizes 1¼" to 2½".

Contact Our Nearest Branch for Details and Prices

GOODALL RUBBER COMPANY

Est. 1870

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Detroit • St. Paul • Los Angeles • San Francisco • Seattle • Spokane • Portland • Salt Lake City • Denver • Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

M-H PROGRAM pays off

THE SOUTHERN California Gas Company has made a comprehensive materials handling program pay off in reduced labor costs per unit, easier control of inventory and doubling of the utility-value of the existing storage space. The saving in warehouse space alone has proven to be a rich reward for the installation of this necessary equipment.

The company was faced with a problem of handling and storing at least 40% more gas meters in their existing warehouse facilities than they had 12 years ago. All meters must be brought back into the shop for maintenance, repair and testing every 10 years.

Prior to 1949, both new and used meters were hand-loaded from trucks into wooden crates, and the unassembled parts were put into bulky wooden boxes. With the new method, it is estimated that the volume being handled is 40% greater, with a 40% saving in labor. Breakage has been reduced to a negligible amount by taking inventory of parts by weight.

Wire baskets

Keystone of the present method is the use of Palletainer wire handling baskets which carry from 30 to 48 meters. Baskets are loaded on semi-live skids which are then quickly unloaded from the highway trucks on to the loading dock equipped with hydraulic dock levelers.

Component parts from manufacturers are handled similarly, being taken in baskets either to assembly rooms or to storage for eventual shipment to outlying stations. Wire baskets are also utilized in the handling of reconditioned meters which travel from repair rooms, through the paint shop, to storage.

The entire materials-handling process now in operation has evolved gradually with installation of equipment during the past four years. While the Palletainer baskets were the principal items, hydraulic dock ramps and lift platforms, jib cranes and forklift trucks have also been integrated into the program.

Prior to installation of this equipment, approximately 4½ hours were required for a truck to be loaded with meters at the general warehouse, the load secured, the ties removed at a sub-storeroom and the meters unloaded and stacked in the sub-storage room. With the utilization of the materials-handling equipment, this same job is now done in 1½ hours.

"We standardized on SKIL Drills after testing 5 leading makes!"

says **Norman Bonomo,** *assistant superintendent,* **B & G Manufacturing Co.,** Pittsburgh, Penna.

Norman Bonomo, assistant superintendent, shows samples of his company's products. This nationally famous maker of aluminum windows and doors has been in business seven years—has tested leading makes of drills and standardized on SKIL.

"SKIL Drills were *first* in ease of handling, *first* in performance, *first* in low maintenance, and *first choice* of our employees," Norman Bonomo explains. "We make aluminum windows and doors for both commercial and private buildings and keep our power tools—especially drills—in constant hard use. Consequently, we ran extreme tests to determine which make of drill would give us best all-around performance with least service worries.

"Employees agreed SKIL Drills handled best with least fatigue—even in cramped places. Management voted for SKIL fast local factory branch service and low maintenance. No other brand measured up to SKIL!"

All 26 SKIL Drill models have these Features

Modern, Compact Design • Helical Gears • Die-Cast Aluminum Housings • Oversize Brushes • Reserve Power • Statically and Dynamically Balanced Motors • Optional speeds available on many models.

Capacities: ¼" to 1" in steel; 2" in hardwood • Speeds: 200 r.p.m. to 5000 r.p.m.

SKIL Saw

SKIL Driver

SKIL Belt Sander

SKIL Disc Sander

SKIL

PORTABLE POWER TOOLS

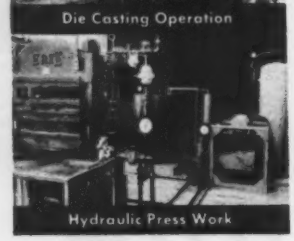
Made only by SKIL Corporation, formerly SKILSAW, Inc., 5033 Elston Avenue, Chicago 30, Illinois
3601 Dundas Street West, Toronto 9, Ontario. Factory Branches in All Leading Cities

For complete information, contact your SKIL distributor or call your nearby SKIL factory branch

High-Pressure Cleaning

High-Pressure Testing

Die Casting Operation


Hydraulic Press Work

One of thousands of uses for high BEAN pressure

PUMPS

This particular BEAN Pump operates at 2000 pounds pressure, delivering only 11 gallons of water per minute. The high-pressure water jets remove the scale instantly and the de-scaled forging is immediately formed in the dies. Two BEAN Pumps handle 3500 projectiles per day.

Your Plant probably doesn't make projectile forgings . . . but it most likely *does* have an operation that could be speeded or simplified by a dependable BEAN Industrial Pump. High pressure works wonders!

Here are more examples:

- **Removing zinc chromate from aircraft**
- **Testing of steel pipe, valves, chain, tanks**
- **Closing of tire retreading molds**
- **Fruit, vegetable, milk and oil homogenizing**
- **Drilling mud circulation for oil well drills**
- **Application of concrete curing compounds**

BEAN High-Pressure Industrial Pumps are designed for rugged service and efficient operation by the world's leading pump manufacturing concern. A BEAN Sales Engineer knows the model that will do your job best.

Write for catalog and for facts dealing with your particular high pressure pumping problem.

fmc TRADE MARK

FOR THE BEST — BUY BEAN

BEAN PUMPS AVAILABLE IN PRESSURES UP TO 10,000 P.S.I.

FOOD MACHINERY AND CHEMICAL CORPORATION
John Bean Division, San Jose 1, California

Gentlemen: Please send me your catalog on BEAN Industrial Pumps.

Name_____

Firm_____

Principal Product_____

Street_____

City_____ Zone____ State_____

ENGINEERING evening classes offered

THE DIVISION of Engineering Extension, University of California, at Berkeley, announces its fall program consisting of 70 evening classes. All classes will be held in San Francisco, Oakland and Berkeley and will commence sometime after the middle of September.

Last year 2,900 enrollments were received for the more than 160 Engineering Extension classes offered in the Bay Area.

Several business firms and government establishments made special arrangements with the University for evening or on-the-job training in engineering subjects.

The following are a few of the courses to be offered this fall:

Recent Developments in Reinforced Concrete Design . BORIS BRESLER

Ultimate strengths and plastic flow of beams and slabs; application of the new deformed reinforcing bars.

Public Utility Evaluation . R. T. PERRY

Techniques of developing utility rate bases for regulatory purposes.

Engineering Applications of Digital Computing Machines

. . . . . ASCHER OPLER

Introduction to principles and application of digital computers for the solution of engineering problems.

Introduction to Quality Control

. . . . . HARRY HUGHES

Second course in drawing conclusions from samples. Reduction of inspection and production costs through application of sampling techniques.

Metallography Laboratory

. . . . JACK WASHBURN

Experiments illustrating effects of heat treating, plastic deformation, recrystallization, etc.

Lubrication and Friction

. . . . L. M. TICHVINSKY

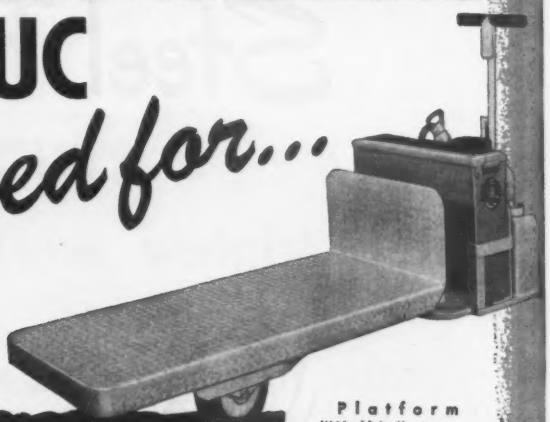
Dry friction and fluid film lubrication for various types of bearings; properties and performance of lubricating oils.

An announcement of courses and additional information concerning evening classes may be obtained at any University Extension center or by calling the Engineering Extension, ASh-berry 3-6000, local 8251.

Inquiries regarding the organization of other engineering courses on the job or at the Extension centers will also be welcomed.

MOTO-TRUC
Designed for...

Pallet type "Walkie" truck 4000 to 6000 lb. capacity.

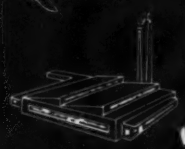


Platform "Walkie" type 4000 to 10,000 lb. capacity.

✓ **PURCHASING DEPT.**
Costs less . . . fits into budgets . . . economical.

✓ **ENGINEERS . . .**
Rugged, all welded construction . . . constant traction . . . stablized 4 point load support on Hi-Lift . . .

Hi lift "Walkie" type 3000 to 4000 lb. capacity.



PLANT MANAGERS . . .
Small . . . compact . . . *minimum* operation and storage area . . .

✓ **OPERATORS . . .**
Simplified operation through "Roller Grip" controls . . . anyone can operate the truck with very limited instruction . . .

Model G. A. Tractor.

✓ **MAINTENANCE MEN . . .**
Especially designed for quick servicing . . . all parts easy to get to . . .

Regardless of individual titles, it will pay you to get *ALL* the facts on MOTO-TRUC . . . and there's a MOTO-TRUC for every purpose.

SEND FOR BULLETIN NO. 51

MOTO-TRUC Designers FOR THE INDUSTRY PATENTED

The **MOTO-TRUC** *Co.*
Representatives in Principal Cities

1963 E. 59th St. • Cleveland 3, Ohio
Pallet . . . Platform . . . Hi-Lift Trucks
LARGEST EXCLUSIVE MANUFACTURER OF "WALKIES"

Steel Problems?

Call Jorgensen First

Immune to steel problems? That's almost impossible, but if you want the right solution—and right now—just call Jorgensen first! There's no stabbing around for the right steel at Jorgensen, because complete warehouse stocks of carbon, alloy, stainless, tool and specialty steels are always ready to be rushed to you at a moment's notice. Don't let a steel problem get under your skin—*CALL JORGENSEN FIRST!*

EARLE M. JORGENSEN CO.
STEEL

LOS ANGELES	OAKLAND	SAN FRANCISCO	DALLAS	HOUSTON
10650 S. Alameda	1657 W. Grand Ave.	Ask Operator for	2200 W. Commerce St.	5311 Clinton Dr.
LUcas 0281	Higate 4-2030	Enterprise 10942	Riverside 1761	ORchard 1621

RESISTANCE WELDING—

CUTS
time, weight, defects

- *Twice as fast as riveting*
- *Streamlines become smooth*
- *Leaky joints are avoided*

WHEN their production is economically practical, resistance-welded assemblies possess desirable characteristics of more strength, less weight and much lower cost than conventional riveted assemblies.

TWENTY YEARS of development work is being climaxed by the rapidly growing use of resistance welding equipment in the production of structural assemblies for the Western aircraft industry.

Resistance welding was, with few notable exceptions, confined to the manufacture of nonstructural assemblies in the aircraft industry prior to the outbreak of war in Korea. This was due to the extreme difficulty of producing machine welds with the consistent qualities essential to maximum structural strength.

Experience convinces

However, experience gained in the assembly of nonstructural parts was sufficient to convince aeronautical engineers that it would be economically desirable to develop resistance welding to the point where it could supplant riveting techniques. They were particularly interested in the assembly of parts comprising the "skin" of a modern all-metal airplane. Their reasons:

(a) A spot or seam weld can be usually produced in less than half the time required to drive a rivet.

(b) Resistance welds can completely eliminate the weight of rivets in the assembly of various parts. If design dictates the use of resistance welding, a saving in weight will be effected. (Liberator bombers of World War II required the structural use of more than a million rivets per plane.)

(c) Perfectly smooth streamlines can be attained on the external surfaces of airplanes if parts are resistance welded. Good rivet assemblies must use counter-sunk rivets or dimple the sheet in rivet areas.

(d) Resistance-welded assemblies with no defects have superior structural integrity, when compared with rivet assemblies of the very best quality. The latter tend to develop loose joints and leaks over a period of time. Leaky joints have done more than anything else to retard the production of seaplanes, which require leakproof hulls and floats, and high-altitude aircraft, which require pressurized cabins.

One of the first experimental efforts to use resistance welding equipment in the assembly of a major aircraft structure took place in the Northrop Aircraft plant at Hawthorne, Calif., in 1933. It involved the construction of an all-metal wing with a homemade device known as the Burns-Northrop seam or spot welder.

This single-phase, rocker-arm machine with internally-cooled, gear-driven weld wheels was capable of welding .040 in.-.040 in. layers of aluminum and stainless steel alloys. It used air pressures of 800 lbs. on its electrodes.

Despite the relative crudeness of this machine, the experimental wing had remarkable structural integrity. However, physical tests disclosed so many small welding defects that the production use of resistance equipment on structural assemblies had to be postponed indefinitely.

Early tests made by Northrop and other aircraft manufacturers disclosed resistance welding deficiencies that were attributable to nothing more than lack of experience and satisfactory equipment. Since many observers were led to decide that the process itself was at fault, little supplemental development work was done prior to World War II.

Air Force authorizes

Manufacturers outside of the aircraft industry had improved resistance welding equipment to such an extent that in 1942 U. S. Air Force officials rather reluctantly authorized the limited production of spotwelded structural assemblies for military airplanes. Extensive controls and rigid inspection procedures were devised to assure the consistent quality of the assemblies. This made production work relatively tedious. Yet the results, from an economic point of view, were astonishing.

For example, where riveted tail booms for Black Widow night fighters had cost about $1,200, spot-welded tail booms for the same planes were produced at a cost of only $500. More-

over, the spotwelded assemblies were of superior quality!

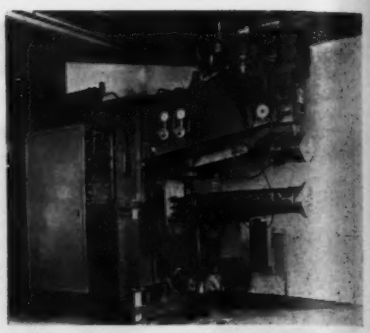
However, officials were reluctant to alter established production setups at a time when military airplanes were so urgently needed, and production cutbacks made it impractical for aircraft manufacturers to buy new welding equipment after the end of World War II. So resistance welding remained a secondary assembly process in the aircraft industry until the present conflict in Korea began.

Since then, resistance welding has done much to neutralize the inflationary pressures that have been brought to bear on the United States' armament program.

Many of the older types of resistance machines are being used to produce aircraft structural assemblies, since their performance is adequate where satisfactory production controls and inspection methods are employed. However, where new equipment has been required to boost production quotas, aircraft engineers have manifested a marked preference for the recently developed three-phase welding machines.

Reasons for this can be briefly summarized as follows:

(1) Three-phase machines facilitate the task of balancing loads on substations and feeders in many circumstances.



ONE of the largest combination roll seamed spot welding machines yet constructed is being used to facilitate production at Northrop.

(2) Machines using DC welding current usually have the best power factor (about 95%, as compared with 85% on frequency converter systems and 10% to 30% on single-phase 60-cycle welders).

(3) The relatively large throat dimensions of three-phase machines permit production of many different assemblies in small or limited quantities.

(4) The electronic controls of three-phase machines can be adapted to many different welding cycles, minimizing the need for skill and alertness on the part of machine operators.

(5) Despite their apparent complexity, three-phase machines can be operated, serviced or repaired with reasonable economy.

Recirculating systems

Due to local water shortages, a few firms like Consolidated Vultee and Solar aircraft companies at San Diego, Calif., have found it necessary to install recirculating water-recovery systems for the purpose of cooling their resistance welding equipment. This was not a severe handicap in view of the fact that the recovery systems tended to reduce electrode pick-up and resultant cleaning time in welding aluminum.

Another special feature of resistance machines used by Consolidated Vultee is a chill and temper timer for steel welding. Its purpose is to allow a steel weld to cool for a predetermined period of time and then to provide a tempering pulse of current which heat-treats the weld. This prevents deficiencies such as brittleness and low fatigue resistance.

The production controls and inspection procedures used by the aircraft industry in machine-welding structural assemblies vary with the types of equipment that are employed.

Take, for example, the case where a slope control would be used to regu-

"GET IT FROM GARRETT!"

LARGEST STOCK OF INDUSTRIAL SUPPLIES, TOOLS, PARTS IN THE WEST!

HEADQUARTERS FOR THESE **FAMOUS BRANDS**

J. H. WILLIAMS & CO. Engineers' Wrenches, Striking Wrenches, Hooks, Handles, Pipe Stands, Vises, Chain Pipe Tongs

BOSTON GEAR WORKS Reducers, Ratiomotors, Stock Gears, Chain and Sprockets, Fafnir and Nice Bearings, Pillow Blocks, Couplings, Universal Joints

GATES RUBBER CO. V-Belts, Sheaves, Pulleys, Variable Speed Transmissions, Hose

YALE AND TOWNE MANUFACTURING CO. Spur and Screw Geared Hoists, Midget King, Load King, and Cable King Electric Hoists

BLACK & DECKER MANUFACTURING CO. Electric Bench Grinders, Electric Drills, Sanders, Saws, Polishers, Hammers and Screw Drivers

SMITH WELDING EQUIPMENT CO. Welding Torches and Cutting Assemblies, Oxygen and Acetylene Regulators, Two-Stage Portable Acetylene Generators and Stationary Acetylene Generators, AC Arc Welders

THE CARBORUNDUM COMPANY Grinding Wheels, Grain, Coated Abrasives (Sandpaper, Belts, Cones, Discs, etc.)

FAULTLESS CASTER CORP. All types of Casters, Swivel and Stationary, Plastic, Rubber, Steel Wheels, Truck Locks

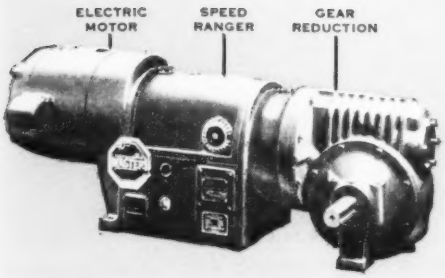
CONGRESS DRIVES DIVISION TANN CORP. Die Cast Sheaves and Pulleys

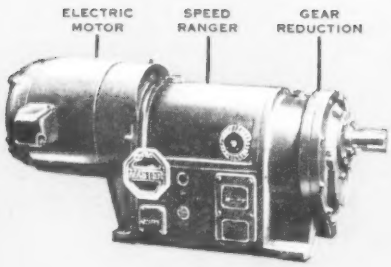
CALL Kimball 7221

GARRETT SUPPLY COMPANY

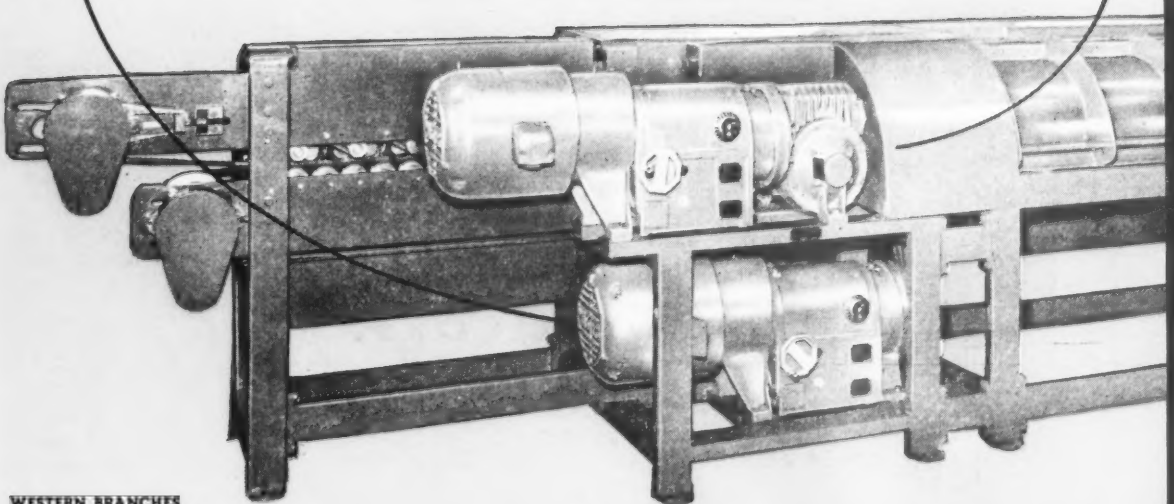
A DIVISION OF THE GARRETT CORPORATION

3844 So. Santa Fe Ave., Los Angeles, California





you can always be right



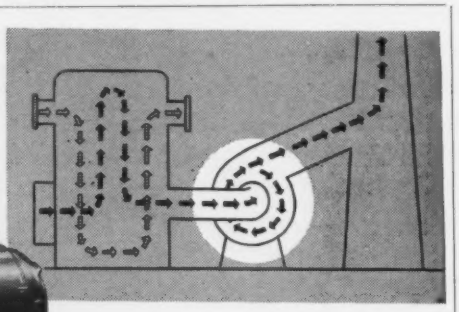
WESTERN BRANCHES

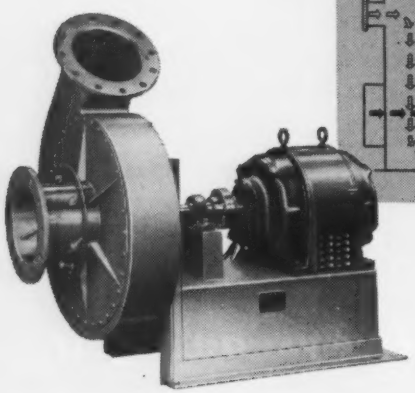
SALT LAKE CITY PORTLAND SPOKANE SEATTLE LOS ANGELES SAN FRANCISCO

late the rise welding current in the operation of an AC machine. A two-trace oscillograph and amplifier units are normally used to check and adjust a DC machine with a calibrated shunt on the lower electrode. This is because DC machines have an inherently slow rate of rise due to the inductance of their welding circuits.

Machine settings for different materials are in most cases empirically determined by data obtained in making test welds. As many as 35 test welds are required in some aircraft plants; then five or six of the welds that appear to be perfect are microsectioned. Test values are generally considered satisfactory if they conform with MIL specifications or company process specifications, whichever are greater.

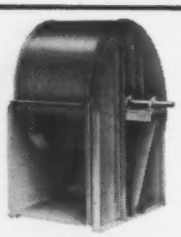
At the start of each production run, and at regular intervals thereafter, weld specimens are produced for test purposes with each machine. The frequency with which specimens are produced usually depends on the nature of the welding equipment. Where older types of machines are employed, as many as three specimens may be required every 30 minutes.



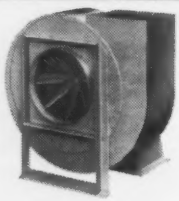


Heat Exchanger

EXHAUST BLOWER



Standard Type FC Blower



Standard Type ME Blower

Standard Type BC Blower

This unit was especially designed to handle spent gases from a recently developed heat exchanger. It creates nearly 2 lbs. of vacuum in order to move the gases through the torturous passages of the exchanger. It has a uniquely designed valve on the intake to permit positive adjustments of the flow without disturbing the pressure balance. It is built of alloy steel to withstand the corrosive action of the spent gases and is equipped with heat slinger and bearing cooling fan for operation with gases at temperatures as high of 600° F.

Master Fan Corp. "know-how" is gained from nearly a third of a century of building standard and special blowers. This "know-how" is always available to you when a problem arises.

MASTER FAN CORP.

1323 Channing Street
Los Angeles 21, California
VAndike 1037

GENERAL VIEW of resistance welding facilities at Stainless Steel Products, Inc., a major producer of aircraft parts at Burbank, Calif.

The specimens are visually inspected, then tested to destruction. If any test weld fails to meet minimum quality specifications, the machine that produced it is taken out of production until it can be thoroughly checked and readjusted or repaired.

Picked personnel

Despite the fact that the latest types of resistance welding equipment do not require great skill on the part of machine operators, all aircraft manufacturers exercise great care in hiring and training their personnel.

While an ignorant or careless employee might now be able to turn out satisfactory work for many weeks at a time, no machine is so perfect that it will not eventually develop certain defects. Thus much damage could be caused where machine failures are supplemented by human incompetence.

In addition to being familiar with the principles of electricity and resistance welding, machine operators are

TWO of the more complex assemblies (sub) that have been produced with welding equipment at Stainless Steel Products, Inc., Burbank, Calif.

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol E.P. Roller Grease

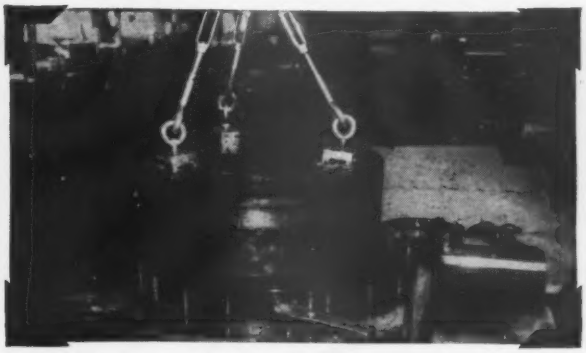
UNIT 16"×44" roll neck bearing

CONDITIONS Temp. to 140°F — extreme pressures

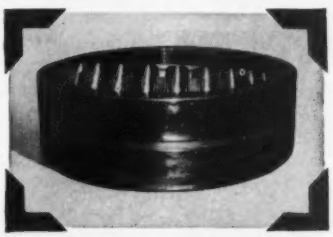
PERIOD 875 hours

FIRM Kaiser Aluminum & Chemical Corp., Spokane, Wash.

Grease retains "body" after 875 hours in rolling mill bearing



CALOL EP ROLLER GREASE-1X, in this big roll neck bearing and chuck, was sealed around the bearing during 875 hours of service in a "hot" rolling mill. No grease leaked from the chuck during operation in temperatures up to 140°F. The grease retains high lubricating qualities—is being changed only because it is practice to remove and service the bearings at intervals of approximately 1000 hours.



THE 2800-POUND BEARING shows no wear on either the rollers or race. There was no sign of corrosion in the chuck and neoprene seals were perfect. After cleaning the unit was re-assembled, refilled with 125 pounds of CALOL EP Roller Grease-1X, and put back in service.

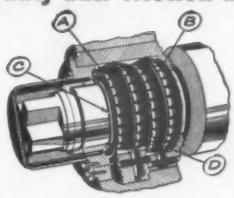
REMARKS: The Kaiser Rolling Mill at Spokane, Washington, produces sheet and coil aluminum. Roll neck bearings in the mill have been lubricated with CALOL EP Roller Grease since 1946. Made from highly specialized stocks, this grease will solve many of your anti-friction and plain bearing lubrication difficulties where extreme pressures, high temperatures or water conditions present problems too great for conventional greases.

FREE CATALOG: "How to Save Money on Equipment Operation," a new booklet full of valuable information, is ready for you. Write or ask for your free copy today.

CALOL

TRADEMARK "CALOL" REG. U.S. PAT. OFF.

How CALOL EP Roller Grease protects heavy-duty anti-friction bearing



A. Contains extreme pressure additives—lubricating film will not squeeze off under heaviest loads.

B. Highly water-resistant—sticks on bearings even where excessive water used for cooling.

C. Feeds slowly and evenly—creeps into small clearances and assures good lubrication. Pumps easily at low temperatures.

D. Will not corrode metal or harm neoprene and plastic seals.

STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA

Announcing .. the opening of

L. B. FOSTER CO's LOS ANGELES OFFICE

Better service for the

Western States

3460 WILSHIRE BLVD.
LOS ANGELES 5, CALIF.
PHONE DUnkirk 3-3156

Bound to be welcome news to ever-growing western industry—L. B. Foster Company opens its Los Angeles headquarters. To users of pipe, rails, and piling who aren't yet Foster customers—we're proud to state that ours is a company that specializes in service—prompt, dependable, backed by the Foster guarantee, and always at the lowest possible prices. Our 50-year list of customers is still growing because buyers seem to "like to do business with Foster." Try us. Let us show you why!

New Telephone DUnkirk 3-3156

L. B. FOSTER CO. 3460 WILSHIRE BLVD. LOS ANGELES 5

PITTSBURGH · CHICAGO · NEW YORK · LOS ANGELES · HOUSTON

expected to keep abreast of new developments. They must demonstrate their competence in this connection by taking and passing periodic tests. Moreover, each operator is held responsible for his machine's output.

Besides making sure that his equipment is functioning satisfactorily at all times, he is expected to reject without welding any work that is improperly cleaned or inadequately aligned at the time it reaches his work station.

Decisions based on . . .

As yet, aircraft engineers have no invariable or universal rules which make it possible to decide whether certain parts or assemblies should be resistance welded or otherwise joined. However, their decisions are usually based on the following factors:

(a) *Permanence of the assembly.* If there is no likelihood that the parts will eventually have to be disassembled for repair, maintenance, or service operations, resistance welding is usually the most desirable (if not always the most practical) method of joining parts.

(b) *Accessibility of the assembly.* The design details of some parts are such that they cannot be reached in areas that should be joined with the electrodes of a welding machine. Such details can usually be avoided, if the parts designer is fully aware of the potentialities of resistance welding. In some cases it is either difficult or impossible to produce a weld pattern with adequate physical properties.

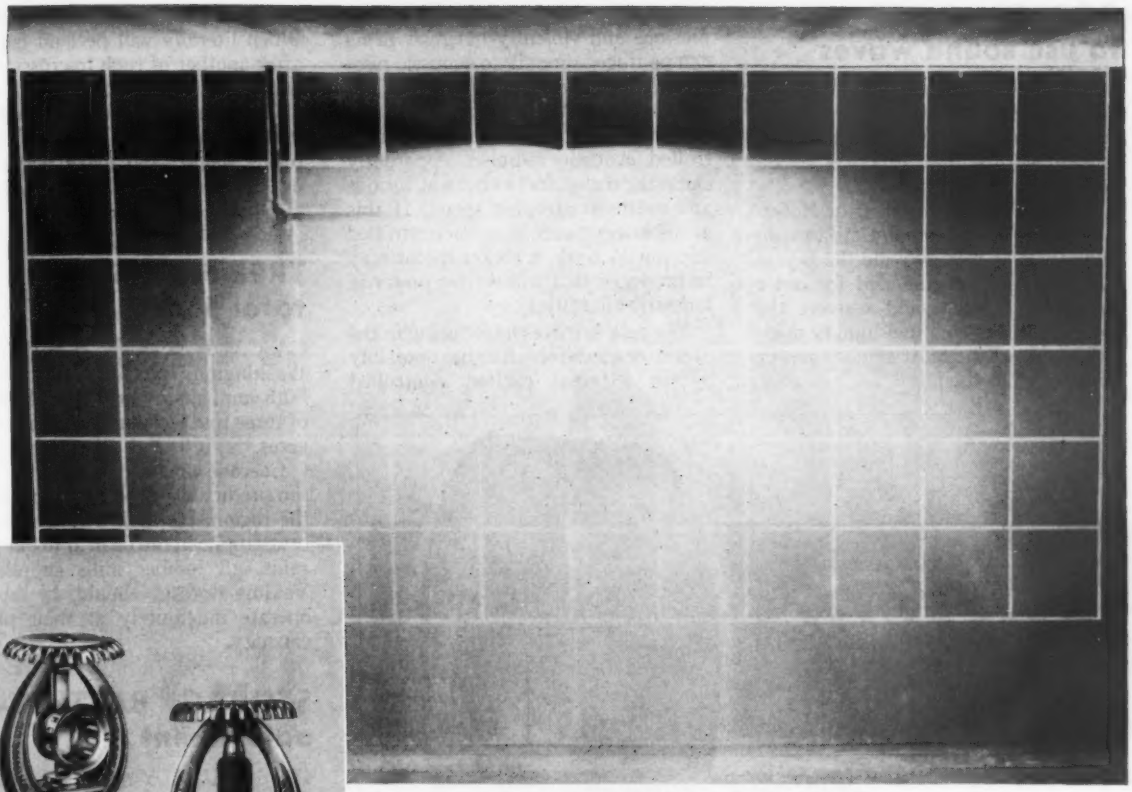
(c) *Availability of welding machines.* In some cases, parts are now being riveted because aircraft manufacturers lack machines with adequate work capacities or do not have enough machines to take full advantage of resistance-welding potentialities.

(d) *Nature of the materials.* Virtually all of the materials now used in aircraft work can be resistance welded to one another. In some circumstances, however, it is impractical to weld dissimilar materials due to electrochemical incompatability or different fusion temperatures.

Inherent advantages

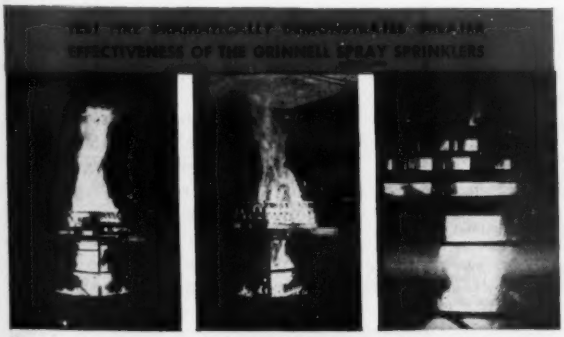
Resistance welding offers:

- 100% time savings over rivets.
- Elimination of rivet weight.
- Superior structural integrity as long as defects are not present.
- Smooth, streamlined surfaces without the need for dimpling or countersinking as required in riveting.



Features: approved by Factory Mutual Laboratories; listed by Underwriters' Laboratories, Inc. • interchangeable with conventional sprinklers • unexcelled release mechanisms.

Put out *MORE FIRE* with *LESS WATER*



Test fire is under way. Under the wood crib is a torch fed by a constant flow of gasoline which prevents extinguishment of the fire. The vapors distilled off from both wood crib and gasoline torch feed the flames which lick ceiling panel.

Heat opens Grinnell upright spray sprinklers. Flame column starts to thin out and break up under the attack of fine sprays. Water vapor from these sprays dilutes the flammable fire gases to extinguish the destructive flames.

Within 4 minutes, sprays have practically killed the fire. After 30 minutes, with torch still roasting wood crib, it was far from destroyed. Ceiling panel was only slightly flame-blackened — even though no water was directed against it.

GRINNELL AUTOMATIC SPRAY SPRINKLERS

provide:

- better protection — the greater the hazard, the greater the improvement in protection
- improved water distribution —*less* water puts out *more* fire.
- more uniform coverage— from multiple operation or from a single sprinkler
- more effective ceiling protection—without wetting the ceiling
- lowered ceiling temperatures —no unnecessary sprinkler openings

why:

- cool fire gases to prevent fire from spreading—by the faster evaporation of the smaller water droplets
- control fire by producing an unburnable mixture of flammable vapors and water vapor
- dilute and diminish supply of flammable vapors with water vapor . . . evaporation of water removes heat, stops the distillation of the flammable vapors from solids—and from many liquids

Send for booklet describing Grinnell Spray Sprinklers in detail.

GRINNELL COMPANY — Western Fire Protection Offices:
Denver • Fresno • Los Angeles • Portland • Sacramento
San Francisco • Seattle • Spokane

GRINNELL
FIRE PROTECTION SYSTEMS

Manufacturing, Engineering and Installation of Automatic Sprinklers Since 1878

ROCKET POWER to use sound waves

SOUND WAVES, used as "acoustic paring knives," may be made to peel layers from burning fuel particles in rocket motors and produce rocket power heretofore unheard of.

Gilbert Magill, president of Rotor-Craft Corp. of Glendale, Calif., maintains that "it may provide the key to fantastic speeds demanded for outer space flight, and could convert the rocket motor from a fuel-hungry monster to one of the most efficient power plants ever devised."

It is apparent that rocket motor explosions and violently irregular firing can be traced directly to acoustic resonance. Tremendous quantities of thermo-chemical energy can be released when this happens. Uncontrolled acoustic impulses apparently cause the rocket fuel to burn at furious and even catastrophic speed. If this acoustic resonance can be controlled and put to work, a rocket motor may be produced that will deliver power in fantastic quantities.

The task involves introducing in the rocket combustion chamber, possibly by an external exciter, controlled acoustic impulses, or sound waves, which literally will peel off one layer after another of each microscopic fuel particle as it is introduced for burning.

This sonic gasification should result in complete burning of fuel within the rocket motor, and make possible the use of inexpensive and normally non-explosive propellants.

TREE FARMS total 50,000 acres

CASCADE Lumber Co., of Yakima, Washington, officially observed its 50th anniversary with the dedication of three tree farm units totaling 50,000 acres.

Cascade president James D. Bronson predicted a solid timber future for the region. He indicated that barring catastrophe in the form of fire or insect raids, all lumber mills supplied by Yakima forests should be able to operate indefinitely at their present capacity.

STORAGE BATTERY— adjustment

IT IS USUALLY necessary to adjust the specific gravity of industrial storage batteries which have been repaired because of leaks, spills, or overflowing. In such cases, the electrolyte is lost and acid must be added to the battery in order to restore the correct specific gravity.

Gould-National Batteries, Inc., issues the following recommendations for best results:

1. Only sulphuric acid should be used and only sulphuric acid specified "For Storage Batteries." Storage battery acid can be obtained from any of the larger manufacturers of sulphuric acid.

2. If the decrease from normal specific gravity is slight, say 15 points or less, acid of 1.300 specific gravity may be added instead of water for several additions over a period of time until a battery is back to the proper gravity.

3. To raise gravity more than 15 points, remove some of the electrolyte from the cell and replace it with 1.400 specific gravity acid. After the normal charge, keep the cell on charge at the finishing rate while adjusting the acid, so that the evolved gas will stir and mix the acid with the remaining electrolyte. One-half to one hour charge is required to mix the acid thoroughly with the liquid already in the cell.

4. If the fully charged specific gravity of a cell is found to be above normal, adjust downward by removing some of the electrolyte and replacing it with pure water. Guard against spe-

Colstrip
COLD ROLLED STRIP STEEL
"THE WEST'S FIRST
COLD ROLLED STRIP MILL"
cut fabricating
PROBLEMS...
GET MORE FINISHED PARTS PER TON
The uniformity of gauge and hardness provided by Colstrip can be important to your fabricating methods. This precision cold-rolled strip steel often means more finished parts per ton with fewer rejects . . . better blanking and forming qualities . . . and minimum die wear. You get a fine surface finish too with Colstrip steel. It's tailored to your exact requirements in gauges from .010" to .125" in any width up to 13". . with round, square or dressed edges.
If you have surplus steel coils or have sizes that are obsolete for current production . . . let us convert it to your exact needs. We have the annealing, cold reducing and slitting facilities to do the job right here in our own mill.
Should you want technical help or more information about Colstrip Steel . . . just call UNderhill 0-1344.
Colstrip
STEEL CORPORATION
MILL AND OFFICES
7140 East Bandini Blvd., Los Angeles 22, Calif.

Need Metal?

Call US...

- **ALUMINUM**
  - Sheet
  - Strip
  - Wire
  - Tubing
- **COPPER AND BRASS**
  - Industrial Tubing
  - Refrigeration Tubing
  - Water Tube
- **BERYLLIUM COPPER**
  - Strip
  - Rod
  - Wire
  - Ingot
  - Castings
  - Safety Tools
- **MAGNESIUM**
  - Sheet
  - Rod
  - Wire
  - Tubing
- **NYLON—TEFLON**
  - Strip
  - Rod
  - Tubing
- **PERFORATED METALS**
- **WIRE CLOTH—SCREEN**
- **PRE-PLATED METALS**
- **BRAZING ALLOYS**
  - Phosco
  - Silver Solders
  - Flux

EBJ CO METALS

STANDARD ITEMS AVAILABLE FOR IMMEDIATE DELIVERY

The E. JORDAN BROOKES CO. Inc.

REPRESENTATIVES AND DISTRIBUTORS

5138 West Jefferson Blvd. • Los Angeles 16, Calif.

Telephone: WEbster 1-1631

San Francisco 7 Front St., YUkon 6-2974 • Seattle 3104 Smith Tower, SEneca 5393

LOS ANGELES • SEATTLE • SAN FRANCISCO

50% faster handling!

Can Brainard Strapping Service help you?

HERE is Brainard salesman Oscar Gagnon of Boston demonstrating a more efficient method of securing rolls of strip steel. The rolls are now banded with heavy-duty Brainard strapping before annealing. Handling is easier all along the way, and operations have been speeded up 50%.

Oscar Gagnon is an old hand in the materials-handling field, and has helped many companies reduce packaging and shipping cost. Like other Brainard salesmen, he has the experience to *study* your operations, *recommend a system* and *demonstrate* to your personnel.

Brainard salesmen can help you develop strapping systems for packaging, palletizing, carloading, bundling, export crating and warehousing. Ask for a Brainard strapping analysis and determine if you can make substantial savings in these operations. In Los Angeles: 1151 South Broadway Street. In San Francisco: 717 Market Street.

COMPLETE STEEL STRAPPING SERVICE, LIGHT AND HEAVY-DUTY STRAPPING, TOOLS AND ACCESSORIES

For further information, write Brainard Steel Division, Sharon Steel Corp., Dept. Q-9, 717 Market Street, San Francisco, California.

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

STEEL STRAPPING

cific gravities above 1.310 because the battery may be injured.

Here are some tips that will help in mixing and adding acid properly.

1. The amount of 1.280 specific gravity electrolyte required per cell can be determined by multiplying the number of positive plates in the cell by a constant.

2. To change specific gravity of sulphuric acid, which is usually 1.835 or 1.400, it is necessary to mix it with pure water. Always add the acid to the water and not the water to the acid. Add acid in small amounts, stirring constantly.

Heat usually develops from mixing acid with water so the mixture should be cooled to 100 deg. F. or below before being added to the cell. Pouring a hot mixture into a cell is likely to injure it.

ELECTRONIC scholarships total $6,000

WEST COAST Electronic Manufacturers' Association has awarded over $6,000 in scholarships for deserving students in electronic engineering or allied branches of technical education.

The scholarships, allowing students to either start or continue studies, have been divided between eight coast institutions in collaboration with the deans of engineering in each college or university.

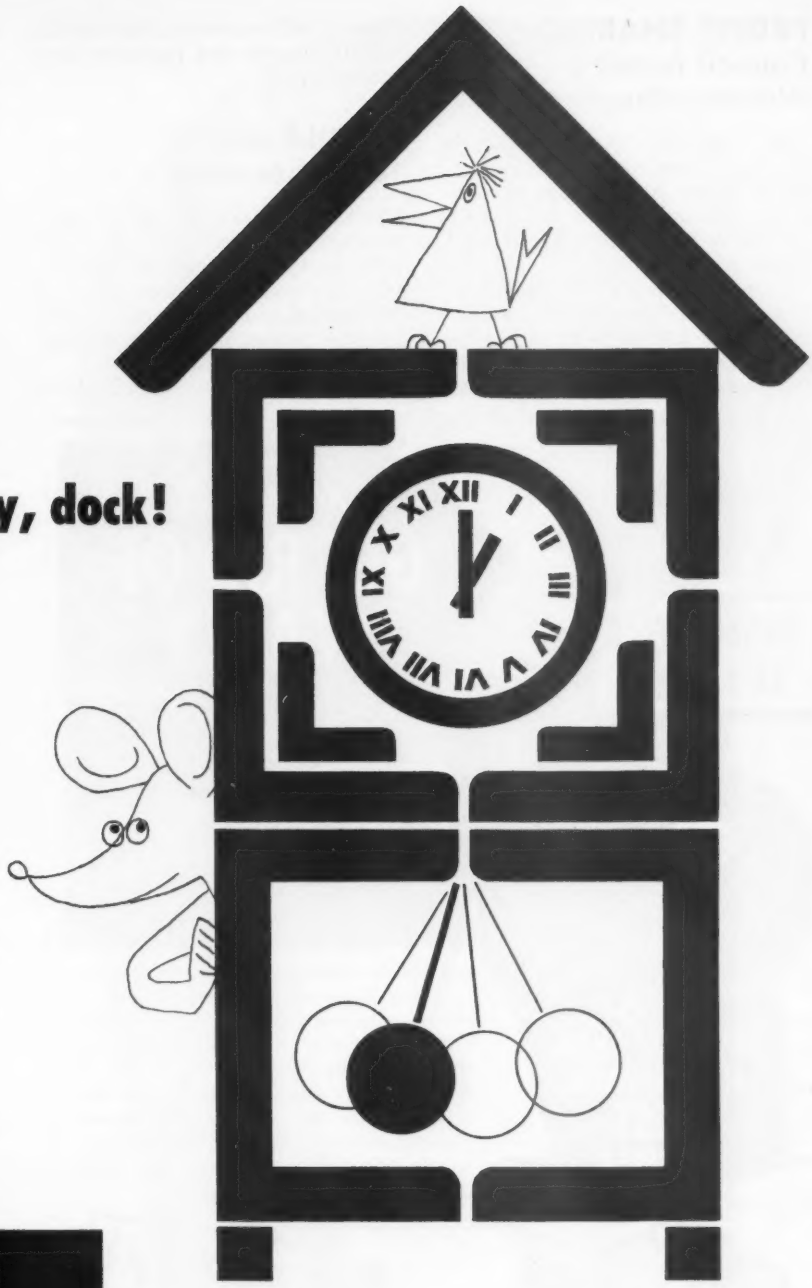
They include: California Institute of Technology, Stanford University, University of Washington, University of California, University of California at Los Angeles, University of Southern California, Oregon State College and the University of Santa Clara.

LABOR EXPERIMENT proves successful

MANAGEMENT and labor changed places in a new and interesting experiment in labor relations which took place recently at the plant of Longren Aircraft Co., Torrance, California. As a result of a plant-wide election, two employees, Ernie Roach and Sam Riffle, found themselves with top executive duties and responsibilities for one day after being elected "Man of the Year, Day Shift" and "Man of the Year, Swing Shift."

The "Man of the Year" award was based on Longren's popular and successful "Man of the Month" plan initiated a year ago. The plan provides personal recognition to outstanding workers and has been enthusiastically participated in by Longren associates.

hickory, dickory, dock!



for aluminum steel magnesium

call Reliance every time . . . anytime

THIS IS A STORY about the Ory boys, Hick, Dick and Doc, who always rely on Reliance. Doc says, "You're wasting your time if you are running up and down the clock hunting for steel, aluminum or magnesium." Dick says, "We struck one service that's complete when we called Reliance." Hick says, "For strip, bars, structurals, plates, sheets and corrugated call ADams 3-3193."

RELY ON RELIANCE STEEL COMPANY

2068 EAST 37TH STREET, LOS ANGELES 58, CALIFORNIA

PROFIT SHARING Council forms Western chapter

THE FORMATION of a California Chapter of the Council of Profit Sharing Industries took place in Los Angeles recently. Offices have been opened in Pasadena at 919-D East California Street.

John C. O'Keefe will be field secretary, and activities of the regional office will be devoted to spreading the gospel of profit sharing as a practice of enlightened modern business management, as well as a means of promoting industrial peace and preserving free enterprise.

MOBILE ADF test laboratory

LEARCAL division of Lear, Inc., producers of aircraft radio, autopilots and radio navigation equipment, has developed a novel and efficient means of engineering and testing ADF radio compass performance in a near-disturbance-free environment.

A mobile trailer laboratory has been designed to resemble, physically and electrically, an aircraft fuselage. This permits ADF systems to be operated under simulated flight conditions in the typical cockpit environment.

The trailer has its own engine-driven power plant capable of producing the 1,500-watt, 117-volt, 60-cycle regulated power needed to operate test equipment, ventilating fans, lights and soldering irons.

The mobile unit can be transported to locations of minimum interference, the mobility feature permitting accurate checks of station bearings. Research on causes and cures of erratic DF radio signals which occur during thunderstorms over mountainous terrain is also facilitated with this mobile laboratory.

SCALE kills Efficiency!
Want to GET RID OF SCALE?
You do? THEN HERE'S YOUR BEST ANSWER
EVIS WATER CONDITIONERS are the modern answer to costly scale problems. The Evis catalytically endows water with new properties. These new properties tend to keep scale in a loose form. In this condition scale is readily washed along through the system by the flow of water, and metal surfaces remain scale-free. It sounds too simple, but it's just that easy with Evis!
• Sold on 90-DAY Money Back Guarantee
Pats. Applied For
SCALE Ups Maintenance Costs
ACID
EVIS DOES AWAY WITH THIS NUISANCE
Ask your Plumbing Supplier; Air Conditioning - Refrigeration or Industrial Specialty Jobber about Evis or write to the nearest Evis Regional Distributor
EVIS WATER CONDITIONERS
EVIS REGIONAL DISTRIBUTORS
LOS ANGELES (Whittier) EVIS COMPANY 11746 E. Whittier Blvd.
CHICAGO EVIS-GREAT LAKES COMPANY 203 N. Wabash Ave.
PHILADELPHIA (Upper Darby) EVIS-MIDEAST CO. 6427 Market Street
SAN FRANCISCO CAL-EVIS COMPANY 74 Dorman Ave.
OMAHA EVIS-MIDWEST, INC. 1504 Dodge St.
NEW YORK CITY EVIS-WALTERS CO. 72 E. 41st Street
SEATTLE EVIS-NORTHWEST 2437 E. Marginal Way
DALLAS EVIS-SOUTHWEST CO. 5543 Dyer Street
MARINE DIST. (Exclusive) MORAN-EVIS COMPANY San Francisco
RENO WATER CONDITIONING SALES CORP. Western American Life Bldg.
ATLANTA EVIS-SOUTHEAST CO. 733 Spring St. N.W.
EV 104
Product of
EVIS MANUFACTURING CO.
SAN FRANCISCO, CALIFORNIA
©1953, EVIS MFG. CO.
• EVIS IS NOT A WATER SOFTENER •

HOG FUEL utilization

TO FACILITATE handling, storage, feeding and efficient combustion of waste lumber trimmings, slab and broken pieces, all must be fed through a hog or disintegrator. This reduces the wood to chips or particles of small size that can be conveyed conveniently. This chipped or shredded wood, together with varying percentages of sawdust and shavings is known as "hog fuel."

The following is a resumé from a speech by W. H. Rambo, an industrial plant engineer in Portland:

Hog fuel is generally a combination of sawdust, coarse chips and planer shavings produced as a by-product of the sawmill industry. In the average sawmill, unless some form of salvage operation is provided for the further processing of wastewood, approximately 50% of the solid volume of the logs sawn is available for the production of hog fuel, or must be disposed of by burning. Although varying with different mills, an approximate distribution of this waste material is: 18% slabs, edgings and trimmings; 10% bark; and 20% sawdust and shavings.

Utilization of slabs in present-day sawmills is more of a problem than in the past, when home consumption of waste slabs, trimmings and other refuse as stove and furnace wood provided an important and profitable market. The widespread use of other fuels, principally oil, has now destroyed all but a fraction of this market.

In the past, practically every mill had a lath mill which converted the best of the slab wood to lath. However, due to high labor costs and the fact that steel and rock lath have virtually

taken over this market, lath mills are now practically non-existent.

A great deal of publicity has been given to utilization of wastewood for chips. This waste, however, has barely been touched and its use has been confined to only a few plants.

There is more waste presently going to burners than ever before, especially in the smaller sawmills, which purchase all their electrical power and do not include dry kiln installations. Most mills use sawdust and shavings for boiler fuel, supplemented with slab wood and hogged fuel only as needed. For a while the home furnace hog fuel burners took the supply of sawdust from most local sawmills, but use of this excellent fuel is now greatly limited and sawdust is a drug on the market.

The state of Oregon is now using hog fuel for heating purposes in many of its institutions, including the State University and College. Many cities and towns use this fuel for central heating, including Portland and Eugene. Montana State University is converting its facilities to burning hog fuel in place of coal, and it is anticipated that the savings will amount to around 50%.

Hog fuel is also presently used for standby or peak load power plant installations, such as that of the Portland General Electric Company.

Because of its bulky nature and varying moisture content, hog fuel is commonly purchased or sold by volume measurement. The accepted standard is the unit, equivalent to 200 cu. ft. as measured, without packing in a truck or railroad car and weighing, at average moisture content, approximately 2 tons.

The average large mill produces slightly more than a unit of hog fuel for each 1,000 ft. of logs handled and will use approximately 50% of the fuel produced for its own steam production. If all of the heavier, clean, solid slab and edging material is diverted to the production of pulp chips, or other salvage uses, the surplus hog fuel available for sale may be reduced to less than one-quarter of a unit per 1,000 ft. of logs sawn.

INDOOR HIGHWAY aids fuel development

CALIFORNIA Research Corp., Richmond, Calif., is now operating an all-weather chassis dynamometer laboratory. This versatile scientific instrument enables Cal. Research engineers to test automotive power plants under most types of driving conditions, without stepping out of the laboratory.

modern handling goes "UPSTAIRS"

Thanks to high-capacity-to-gross-weight Lewis-Shepard Model "J" Electric Fork Trucks, National Cold Storage Company handles up to one million pounds of goods per day at its Brooklyn plant. In these multi-story buildings, flexible, highly maneuverable fork trucks are a must.

Here's what Mr. Woody Caine of National says about his sturdy Model "J's".

"We have standardized on the Lewis-Shepard "J" for all our storage areas. They are compact . . . permitting efficient operation in any part of the plant. Their over-all weight is completely within the capacity of all our elevators. We get the high lift we need in minimum aisles, 8 and occasionally 7 feet wide."

LEWIS-SHEPARD®

The MASTER Line

GET ALL THE FACTS

COMPARE and prove to yourself why the "J" is the "Most Maneuverable" truck in the field. Write today for Comparison Charts and Proof Folders.

LEWIS-SHEPARD, 242-9 Walnut St., Watertown 72, Mass.

Please send ☐ "Proof Folders" showing L-S Trucks at work
☐ "Electric Fork Truck Comparison Charts"

Name.....

Company.....

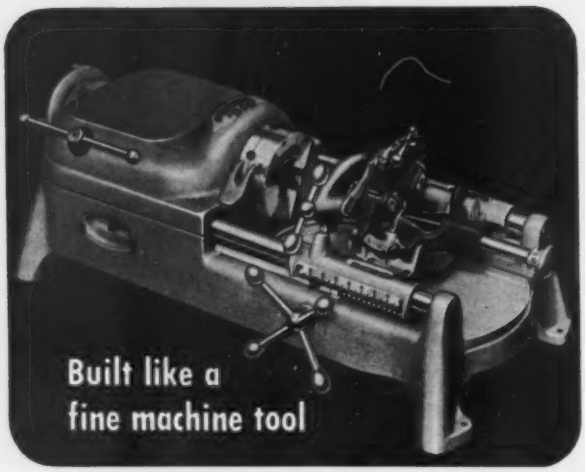
Street.....

City.....State.....

The pipe and bolt threading machine that gives you

Top Performance

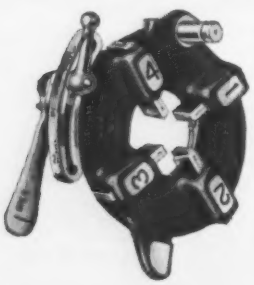
RIDGID "500"



...with exclusive new quick-opening

Quadritype Die Head

RIDGID engineering does it again! New "500" threads, cuts and reams with the efficiency and speed you've long wanted. Ready for work on any size pipe, ⅛" to 2", in seconds! Independent operation of tools, more than ample power, concealed oil system — a score of other great new features. No wonder its popularity has been immediate and wide-spread. See it, try it at your Supply House — buy the more-for-your-money RIDGID "500"!



New Quadritype die head adjusts instantly 1" to 2" regardless of position of lever, without removing dies or head from machine. Same work-saver feature in Dualtype die heads—¼" and ⅜", ½" and ¾". Monotype also available, ⅛" to 2"—also bolt die heads, ¼" to 2".

THE RIDGE TOOL COMPANY • ELYRIA, OHIO

ATOMIC POWER— rival of coal

CLYDE OSBORN of the Kerr-McGee Oil Industries, speaking at the Rocky Mountain Coal Mining Institute, revealed his organization's estimates of how much uranium metal would be required to produce 400 billion kwh.

His figures maintain that 18,000 tons of metal were required without the aid of plutonium, while only 6,500 tons were required with plutonium added. With energy supplied from a breeder reactor, only 150 tons would be needed.

His conclusions indicated that atomic power would not be an economic threat to coal with uranium at $35 per pound and coal at $12 per ton, but would be with uranium metal at $2 a pound. These figures do not include the high cost of handling the dangerous tailings from an atomic power plant.

Charles M. Schloss of Denver, quoting recently published figures, indicated that electrical power costs from 3 to 15 mills per kwh. On the other hand, conservative estimates indicate that the cost for atomic generation of electrical power would be from 15 to 40 mills per kwh.

REACTOR STATION consolidates activities

THE U. S. Atomic Energy Commission has approved a proposal for consolidating a number of its activities at the National Reactor Testing Station at Idaho Falls under the management of the Phillips Petroleum Co.

At present, activities included in the consolidation are being performed by a number of contractors and the AEC itself. Substantial economies of operation, eliminating fees and overhead expenses in excess of $250,000 annually, are expected. The program follows completion of the start-up periods for various plants and activities, and their being placed in fully operational condition.

Phillips Petroleum will continue to operate the Materials Testing Reactor and in addition will assume management of the following activities: operation of the chemical processing plant; operation of central maintenance, craft and service facilities; operation of the transportation system; operation of the technical library and document control; warehousing, procurement and property disposal; and operation of reproduction facilities.

EXTRAORDINARY PRECAUTIONS yield "zero" losses

DEL-AIR Products, Los Angeles, has developed an individual surface protector sheet plus a specially designed shipping box that have resulted in "zero" damage losses, ease of handling and continuous advertising values.

These extraordinary precautions are practically unheard of in local aircraft subcontracting fields. However, favorable comment from prime contractors has proved it to be worthwhile, and not only from a service viewpoint, but from savings in costs on repairs of returned damaged parts.

The paper protector on the skin is applied as quickly as sticking on a postage stamp, yet it comes off as easily as scotch tape. Each cover carries a warning about continued care of the surface.

Shipping boxes are designed to accommodate several sizes of flaps in slotted sections. Handles and casters facilitate moving and stacking of the boxes. Caster wells in the box tops aid stacking, and a three- or four-tier stack of boxes can pushed around as easily as one.

You're looking at steel sheets being made to order!

Even as it pours from the open hearth into a ladle, this steel already has a personality of its own. For this is not just steel, but steel designed for a *specific purpose*... in this case, sheets for steel furniture. Another batch might be for cabinets, home appliances, or any one of a thousand other applications. From the very beginning, steel from Columbia-Geneva is tailor-made to do the best job for you.

Knowing the end use for your steel, and working within the appropriate standards for your particular application, Columbia-Geneva metallurgists and other trained technical personnel are able to rigidly control the steel from start to finish. The results of this extra attention show up in the high quality of your finished products, and in the lack of rejects on your production line.

We like to think that this extra attention is also reflected by the fact that Columbia-Geneva stands today as the West's largest steel producer.

U·S·S Steel Sheets

COLUMBIA-GENEVA STEEL

Division United States Steel Corporation, San Francisco

UNITED STATES STEEL

HOT
OFF THE PRESS
and

1953 Edition

Mall

PNEUMATIC TOOL CATALOG

DRILLS

SCREWDRIVERS

GRINDERS

POLISHERS

SAWS

SANDERS

Yours free—the new, info-packed MALL catalog showing the very latest pneumatic tools available. It's a MUST for your reference file. Send for it today and get all the facts about the world-famous MALL line of completely modern pneumatic production tools . . . a size and style for every need.

Get Your FREE COPY NOW!

MU-23

MALL TOOL COMPANY
7810 S. Chicago Ave. Chicago 19, Ill.

RUSH me a free copy of the 1953 MALL Pneumatic Tool catalog.

*Name*_____

*Firm*_____

*Address*_____

HELPFUL LITERATURE
for the plant operator who wants to keep informed

Use rip-out post-card for your free copies

1

New arrivals in tape recorders and reproducers

Ampex introduces with separate brochures its Model 350 tape recorder and Model 450 continuous tape reproducer. Each four-page bulletin points out new features and advantages of this equipment and describes, in a table, model's general performance characteristics and specifications. *Ampex Electric Corp.* AB 3-1-2 and AB 3-2-1

2

"Strength where it's needed—on the bottom"

That's the title of six-page well illustrated folder describing Permanente 165 Periclase ramming and patching material for construction and maintenance of basic open-hearth furnace bottoms. Data on typical chemical and physical properties supplements general discussion of product. *Kaiser Aluminum & Chemical Sales, Inc.*

3

Scaffolds without nuts and bolts

Advance tubular steel rolling scaffold towers, assembled by means of self-contained cam locks and stack locks, are subject of brief new four-page folder. In addition to explaining how rolling towers and stationary scaffolds are easily assembled, booklet suggests uses in construction and maintenance work. *Advance Scaffold Division, Beaver Art Metal Corp.* 52

4

Wool felt reference sample

A very impressive folder from *American Felt Co.* comes complete with product samples: mechanical roll felts, sheet felts and roll felts for apparel and decorative trades. Bound into folder is Commercial Standard 185-52, "a recorded voluntary standard of the trade," published by U.S. Department of Commerce.

5

Specifications on fibre packaging drums

Three four-page brochures give complete specification and application data on full range of sizes of fibre drum packaging containers manufactured by *Continental Can Co.* Bulk products manufacturers and shippers of small, irregular shaped objects will be particularly interested.

6

The story of "The Builders"

This 32-page illustrated booklet tells of men "whose labors have enlarged and widened our civilization." Providing a tribute to workers of Du Pont's engineering department, it states that . . . technology, if allowed to progress unhampered, can double living standards of average U.S. family within 30 years. *E. I. du Pont de Nemours and Co., Inc.*

7

All about sleeve bearings

General catalog No. 109, put out for *Randall Graphite Bearings, Inc.*, offers design engineers concise and condensed information and specifications concerning Randall bronze sleeve bearing products. Among units touched upon is series 178F-278F with an inner and outer steel retaining ring which, when bolted together, provides a self-aligning flange bearing unit.

8

Jacketed fittings and pipe for welding

Red Jacket Co., Inc., now sends out a fine folder which includes specifications and complete dimensional information on its new line of jacket pipe and pipe fittings for use in welding. Big specification charts plus engineering drawings will be especially helpful to piping engineers and maintenance men.

9

The general paint picture

General Paint Corp. offers a whole library of literature on its products. First off is a color sample folder of Industrex (for brushing) and Marvatex (for spraying) in popular colors for finishing machinery, motors, equipment, etc. Also available is a condensed reference chart on Viro Clad corrosion resistant coatings. Chart embraces

usage, application procedures, and properties of 200, 400, 600, 700 and 800 systems. Folders on each of these systems will also come to you for asking.

10

"Binders That Build Business"

New 40-page booklet with this title, released by *Remington Rand, Inc.*, describes and illustrates over 20 looseleaf binders, incorporating improved locking mechanisms, a striking choice of posts, prongs and rings, and new cover material. "Rem-Bossed" printing and embossing process for personalizing binders is introduced along with the new line of binders. LL234

11

How to scrap shipping costs on scrap

"Catalog of Facilities," published by *Reynolds Aluminum Fabricating Service*, begins by tracing development of Reynolds parts and sub-assembly manufacture. During World War II, shipping blanked-out aircraft parts instead of sheet aluminum saved costs on two-way movement of metal as well as space on rail facilities. Today, this service supplies parts as varied as television antennae, washing machine tubs, trailer bodies, even complete hulls for 12-ft. boats stamped at one stroke of a press from a single sheet of aluminum. Sixteen of the 24 pages in this booklet show presses, furnaces and other equipment of Reynolds Fabricating plants—facilities adaptable to parts production for a wide range of industries.

12

Meet some titanium producers

"Meet Mallory-Sharon" starts out with a run-down of this firm's background and its future objectives. It continues with how you can use advantages of its product, makes a hospitable offer to send you technical bulletins, as they are prepared, on titanium and titanium alloys, and winds up with a chart of tentative nominal properties of company's titanium alloys. *Mallory-Sharon Titanium Corp.*

13

Water conditioning—from A to Z

Elgin Softener Corp. has new 20-page bulletin showing its complete line of equipment and methods. Among subjects discussed and illustrated are water softeners, zeolites, ion exchange resins, filters and purifiers, degasitors, and water treating chemicals. 611A

Another Elgin bulletin, a 4-page folder, describes company's automatic water softener, equipped with an automatic pilot that "does everything but think." 612

JUST OFF THE PRESS ...and FREE!

What it Contains

- Complete Caster recommendations for industries, institutions, etc. using mobile equipment.
- Complete listing of all type wheels for floor and load conditions.
- Complete presentation of Casters engineered for
  1. Light Duty
  2. Medium Duty
  3. Heavy Duty Work
  4. Special Duty Work
- Industry's most complete line of DOUBLE BALL BEARING SWIVEL Casters backed by over 60 years of engineering experience.
- Patented Double-Spring Action Casters that absorb bounce and jounce, have *interchangeable standard wheels*, swivel regardless of over-load.
- 80 pages of data to help solve your materials handling problems.

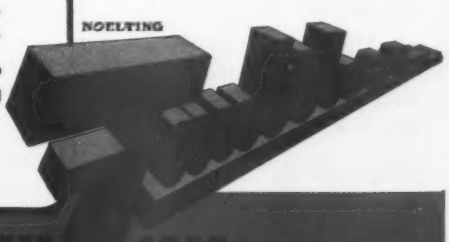
YOUR GUIDE TO SOLVING MATERIALS HANDLING PROBLEMS!

To help you with your handling problems . . . loads, floor surfaces, types of wheels . . . you should have Faultless Caster Catalog 157.

Selection tables, recommendations of correct type casters for specific equipment, what wheel constructions are best under certain circumstances—and much related engineering data are clearly given in Catalog 157.

In addition, you will find descriptions, illustrations and specifications on the most complete line of Double Ball Bearing Swivel and Rigid Casters ever supplied to industry.

Catalog 157, requested on company letterhead, is yours for the asking. And so are the services of our engineering staff—for special problems—without obligation.



FAULTLESS CASTER CORP.

YOU CAN PROFITABLY USE

YUBA's Manufacturing Facilities

Located in San Francisco Bay Area at Benicia

For contract manufacturing and for sub-contracting parts and assemblies, use YUBA and save time, expense, and personnel worries. Our varied plant facilities enable us to handle almost any metal product—light or heavy. We have skilled workers and a long-time reputation for stable labor relations, plus years of experience in contract manufacturing and fabricating for private industry and government.

Services Available to You Include—

- ✓ Carbon and alloy steel forging
- ✓ Heat treating
- ✓ Steel fabricating and welding
- ✓ Pattern shop
- ✓ Iron and bronze foundry
- ✓ Heavy and light machining
- ✓ Export packaging

These services are especially adaptable to manufacturers wishing to sub-contract defense orders.

HANDY SETUP... FACTORY AT BENICIA OFFICES IN S. F.

YUBA's plant is located at Benicia., Calif., handy to deep water, transcontinental railroad, truck and air shipping. General offices and engineering department are situated in San Francisco's financial district.

Send us your drawings and specifications for estimates. No obligation. Write, wire or telephone EXbrook 2-0274.

YUBA MANUFACTURING CO.

Room 701 • 351 California St • San Francisco 4, Calif.

14

Advantages of magnetic brakes listed

Dings Brakes, Inc., in a 6-page folder, sets out to show features of Dings disc-type magnetic brake, used in machine tools, hoists, cranes, elevators, and other applications requiring automatic, controlled braking. Cross-section drawing of brake and diagrams of motor and floor mounting, for both fractional and integral horsepower brakes, are included. B-4000-B

15

Tongs and hooks

A handsome 24-page booklet, published by *Heppenstall Co.*, describes materials handling tongs and "C" hooks in a variety of applications. Heppenstall tongs are pictured lifting red hot turrets for tanks, picking up hot ingots in a horizontal position and lowering them in a vertical position into a die, raising sheet steel, handling coils and in other operations.

16

Western Gear Works' technical bulletin

New bulletin of *Western Gear Works* explains design of Pacific-Western Torq-Master transmission for application to torque-converters. Four-page folder includes outline dimension diagram and sectional diagram of Torq-Master. 5328

17

Tubular conveyors

Hapman Conveyors, Inc., division of *Hapman-Dutton Co.*, has new 4-page bulletin on mechanical details and engineering applications of its tubular conveyors. "Sealed-pin chain" design is illustrated, and nine typical conveyor layouts are diagrammed. HEM 137

18

Guide to Snap-on Tools

Here's a 104-page catalog of mechanics' tools for production, maintenance and service work throughout all industry. Catalog is illustrated and indexed. *Snap-On Tools Corp.* "U"

19

Two new Tuthill publications

Catalog 101 covers Tuthill Model L series of small industrial pumps for lubricating, hydraulic, transfer, circulating and burning oils service. Catalog 102 presents Model C series of general purpose pumps. Each has pump guide at front which gives service, operating data and special features of all models. Dimensions and parts diagrams, performance curves and mounting styles are shown in both 12-page bulletins. *Tuthill Pump Co.*

20

Solvent vapor degreasers for your cleaning problems

Bulletin of *Vapor Engineering Corp.* presents Weldbilt vapor degreasers and discusses their performance in cleaning and processing operations. Machines are manufactured in wide range of types and sizes, heated by steam, gas or electricity. V105

21

Wash, rinse and dry off

Industrial washing and processing equipment bulletin of *Industrial Systems, Inc.*, pictures nine typical units designed, manufactured and installed by this firm. Bulletin offers free engineering assistance and estimates on cleaning problems. W-106

22

Pressure and vacuum equipment described

Bulletin put out by Air Appliance Division, *U. S. Hoffman Machinery Corp.*, lists 17 industrial applications of Hoffman multistage centrifugal blowers and exhausters for 1 to 9 psi. pressures or vacuum from 2 to 12 in. mercury. Typical performance curves and check lists of data required for optimum blower or exhauster specification are included. A-932

23

Equipment catalog, "where a penny means something"

Green-Penny Co.'s current catalog on metal plant and office equipment offers 12 pages of cabinets and counters, lockers and work benches, trucks and carts, and many other useful items.

24

"Adhesives, Coatings and Sealers"

Bulletin with this title, published by Adhesives and Coatings division, *Minnesota Mining and Manufacturing Co.*, is a guide to selection of right product for a particular manufacturing problem. Tables have column headings covering uses of each type, method of application, color, base, solvent, viscosity, per cent solids by weight, and net weight in lb. per gal. Photographs illustrate 8-page booklet.

25

Bulletin on units for heating, ventilating and air conditioning

Six-page bulletin issued by *Westinghouse Electric Corp.* describes air handling units for industrial and commercial heating, ventilating and air conditioning. Installation possibilities are discussed, and accessories, such as humidifiers, mixing boxes and filter sections, are also covered. 1600

26

Meet the men who know the answers

Heat and Control, Inc., introduces senior members of their staff in this photo-checkered pamphlet. Engineering, design, construction and service facilities of firm are explained, supplemented by a list of equipment available from manufacturers represented.

27

Here are JIC standards on hydraulic steel tubing

New folder put out by *Joseph T. Ryerson & Son, Inc.*, gives Joint Industries Conference recommended practice for cold drawn and annealed seamless low carbon steel pressure tubing for use as hydraulic lines. How Ryerson hydraulic fluid line tubing meets or exceeds hydraulic standards is explained in pamphlet. 12-2

28

Eight pages on industrial filtration

Brochure by *U. S. Hoffman Machinery Corp.* describes and illustrates its ten basic types of industrial filtration equipment—disc, cartridge and pressure type filters, flotation units, vacuum stills, magnetic separators and oil conditioners.

29

Group lamp replacement methods and case histories

Ten-page brochure of *General Electric Co.'s* Lamp division describes and illustrates lamp group replacement plans used in a number of factories, offices and stores across country. Titled "Group Lamp Replacement Pays Off," publication gives reasons why.

30

A conveyor belt design for every purpose

In a beautifully produced, spiral bound, 132-page book, *The Cambridge Wire Cloth Co.* presents its Cambridge conveyor belts for processing industrial products. Just about every possible subject is covered complete with diagrams, pictures, tables, charts, etc.

31

For speedy punching, notching and nibbling

Wales-Strippit Corportion's eight-page catalog describes and illustrates Wales sheet metal fabricator. Text emphasizes rapid adaptation of fabricator to different operations through interchangeable parts. 10-AA

32

Triple-chip circular sawing

Triple-chip method of sawing, based upon grinding blades with teeth alter-

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD
First Class Permit No. 3755, Sec. 34.9, P. L. & R., San Francisco, Calif.

WESTERN INDUSTRY
609 Mission Street
San Francisco 5, Calif.

USE A POSTCARD for THESE THREE FREE SERVICES

1. For your free copies of **HELPFUL LITERATURE** reviewed in this issue, circle appropriate key numbers.
2. For more information on **NEW MATERIALS AND EQUIPMENT** previewed on following pages, circle key numbers.
3. For complete information on **PRODUCTS ADVERTISED** in this issue, fill in page number and name of advertiser.

Send free booklets and more information on new products listed under circled key numbers:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Send complete information about products advertised on:

Page..... **by**.....

Page..... **by**.....

Page..... **by**.....

Name.....

Address.....

.....

Position.....

Organization..... **SEPT. 1953**

Send free booklets and more information on new products listed under circled key numbers:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Send complete information about products advertised on:

Page..... **by**.....

Page..... **by**.....

Page..... **by**.....

Name.....

Address.....

.....

Position.....

Organization..... **SEPT. 1953**

New products and manufacturers' booklets reviewed in *Western Industry* are screened and selected for your needs. The advertisers in *Western Industry* call your attention to important services and developments available to Western firms in this period of dynamic growth. Take this opportunity for aid in keeping your business in step with this growth.

YOUR REQUEST on a POSTCARD

will result in our prompt and thoughtful action.

There is no obligation to you for this service.

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD
First Class Permit No. 3755, Sec. 34.9, P. L. & R., San Francisco, Calif.

WESTERN INDUSTRY

609 Mission Street

San Francisco 5, Calif.

nately high and low, is explained in this 8-page booklet put out by *Motch & Merryweather Machinery Co.* Other slitting and slotting saws, circular knives, and special products are illustrated or described.

33

Catalog of fixture clamps and details

Morton Machine Works' Catalog No. 4 contains 10 pages of photographs and about 60 pages of well-presented diagrams and tables on Morton fixture clamps and standard fixture components. *Dillon Stevens & Co.* is new Western distributor for this firm's products.

34

Thor presents new electric drill and drill kit

Thor Power Tool Co. uses illustrated folder to introduce its new ¼-in. electric drill and drill kit which comes furnished with assorted accessories—precision arbor, 3-in. grinding wheel, 4-in. wire brush and 3-in. buffing wheel.

35

Join an inspection tour of Exide research laboratories and plant

Electric Storage Battery Co. issues 30-page booklet on its research and production facilities at Philadelphia, with many photographs of operations and laboratory and plant equipment. Text of booklet corrects the impression that, because an Exide battery shows little outside change from year to year, it stays the same inside.

36

Push-button plants need centralized lubrication

Twenty-page illustrated booklet explains *The Farval Corp.'s* centralized lubrication systems and equipment. Photographs show Farval at work in a variety of industries. Service offered by representatives of company in selecting proper equipment is also described. 26

37

New type of pipe insulation

Here are eight pages of selection and materials tables, hot and cold line application data, valves and fittings applications of new type insulation, Aerowrap, a product of *Owens-Corning Fiberglas Corp.* Good stuff for the maintenance man. IN6.A5

38

Arcwelding machines catalog

Air Reduction Pacific Co.'s new 43-page catalog covers over 20 different models of arc welding machines, with descriptions, specifications, and electrical data. Sections on accessories and electrodes are also included. 1340

USE RIP-OUT POSTCARD for more information on products introduced this month.

NEW MATERIALS & EQUIPMENT

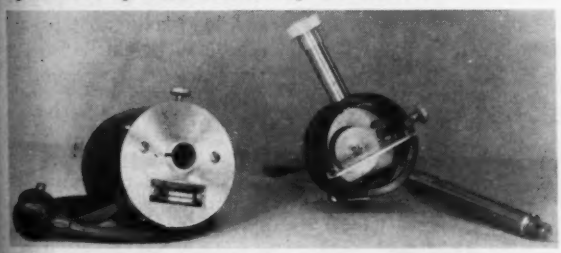
39

High in the air

Here is a new mobile hydraulic personnel lift for use in construction and maintenance work in manufacturing plants. By use of this device, a working crew can raise itself or 6,000 lb. of building materials, on an 8-ft. platform, as high as 68 ft. above ground. Platform is operated by dual hydraulic controls both on platform and on ground. It can be rotated 360 deg. from top and can be used for raising trusses, tank tops, heavy pipes, etc. Fully retracted, lift, with guard rail collapsed, requires only 13-ft., 6-in. clearance and is readily moved to any part of a job. *Hamlin-Klock Corp.*

40

Specimen spinner for X-ray diffraction



This new cylindrical specimen spinner is designed to facilitate handling of specimens of limited size and quantity where problem involves individual analysis of small fibers or filaments, use of capillary tubes, or coated fiber method. Unit is used in place of standard specimen holder of Norelco wide-range goniometer for special X-ray analysis work. *North American Philips Co., Inc.*

41

Quick-drying oil for protective coatings

Safflower 22 is a newly developed drying oil for protective coating industry. Conjugation of Safflower oil has produced an oil which is said to retain all of its former desirable properties such as color, color retention and flexibility. To these have been added a faster drying speed and a faster polymerization rate. *Pacific Vegetable Oil Corp.*

42

High density cast iron rod for better welds

EutecRod 143FC is newly developed to meet demand for an oxy-acetylene welding rod for cast iron that will combine dense welds and high tensile strength together with better appearance. This new flux-coated rod (also available bare) is said to contain special alloying elements along with improved coating which results in smooth, clean welds where appearance is an important factor on cast iron work. Square rods are being manufactured in full size range: 3/8 in., 1/4 in., 3/16 in., and 1/8 in. *Eutectic Welding Alloys Corp.*

43

Underhung crane handles heavy loads efficiently

Heavier loads with greater efficiency and versatility is theme for this new underhung crane system. Tram Chief Cranes feature extra wide flange silicon steel (average Brinnel hardness 185) beams for bridge girders and runways. Beams are said to reduce lower flange stress by close carrier head tread and wide lower flanges. Capacities available five to 15 tons. *Crane Hoist Engineering Corp.*

44

Electronically "welded" seams

Vulcafilm is a new rubber film combining properties of plastics and man-made rubber. It can be electronically sealed to itself and permits assembly of shapes or vessels of any size with fused, homogenous seams throughout. These seams are said to be stronger than material proper. Cementing or taping seams is not required. Compound may be varied to obtain resistance to oil, gasoline, sunlight, heat, cold, abrasion and acids. *B. F. Goodrich Co.*

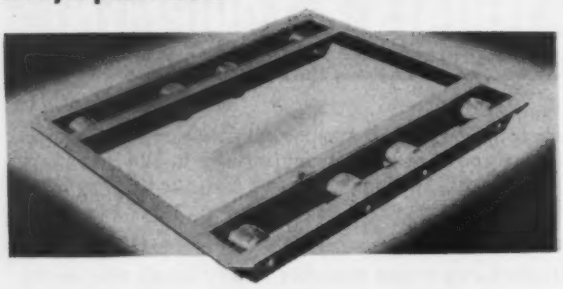
45

Washer units speed metal cleaning

A new line of compact, forced-circulation washers in three different sizes is designed to speed metal cleaning through automatic cycling and by combining washing and rinsing in a single operation. These single-stage units eliminate secondary washing and extra work handling operations by employing an automatic surface spray skim-off. For average load conditions, a total cycle of five to seven minutes is termed sufficient to thoroughly clean work-pieces. *Ipsen Industries, Inc.*

46

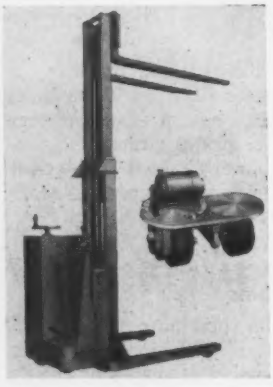
A royal pallet roller



Ace "Swivel King" pallet rollers are said to permit effortless movement of palletized loads in any direction and to any location, thus speeding up material flow and product movement. Rolls are heavy gauge, large diameter; have crowned ends for free rolling and floor protection. Bearings are heavy duty. Frame is constructed of high tensile strength steel, fully welded. *Frank L. Robinson Co.*

47

A new stacker transveyor for crowded areas



A new electric industrial truck, Stacker Transveyor, produced by *Automatic Transportation Co.*, is a compact stacker designed for use where narrow aisles, close quarters and limited floor or elevator space are factors. This basic model handles 2,500-lb., 48-in. loads and is available with two mast heights, 68 and 83 in., providing 102½ or 132½ in. of telescopic lift. This battery-powered truck has four wheels with 3-point suspension. (This same item appeared last month accompanied by the incorrect picture.)

48

For keeping water out

A wide variety of materials ranging from paper to clay and concrete now can be made water repellant by treatment with Dow Corning XS-1. It is applied, as a dilute solution prepared from 25% solids solution of a water soluble silicone, by brush, spray, dip or by mixing with paper or clay slurries. *Dow Corning Corp.*

49

Belt conveyor with side-mounted drive motor

Metzgar belt conveyor features side-mounted drive motor to permit close-to-floor installation and to replace hand trucks for loading and receiving where transports cannot reach storage and receiving area. It may be installed horizontal or on medium incline. It is built to specification for inclined installation. *Metzgar Co.*

50

Atmospheric storage tanks standardized

New standard tanks for storage of materials at atmospheric or low pressures are now being manufactured. With this move, raw tank materials will be stockpiled and delivery time may be cut up to 80% resulting in lower material and labor costs. Previously, all tanks were tailor-made to customer specifications with materials ordered as needed. Standard tanks are available in capacities ranging from 5,800 to 16,400 gal. and are of both horizontal and vertical types. *Aluminum Co. of America.*

51

New line of fork lift trucks

A new series of 106-in. wheelbase fork lift trucks have been added to the *Gerlinger Carrier Co.'s* line. "S" line, with lift capacities of from four to eight tons, completes a series begun two years ago. New series offers exclusive counteractive weight distribution assuring perfect balance over rough roads regardless of load-size variations. Fifty-four per cent weight remains over front wheels while stationary load axle absorbs all dead load weight.

52

Shut-off valve for safety

Valco safety valve is an automatic, temperature-actuated safety shut-off valve for use in all flammable liquid and gas lines. This quick closing device is normally held in open position by a Factory Mutual and Underwriters' approved actuating head that operates like a standard sprinkler head. At specified temperature, head opens and releases tension on a strong stainless steel spring which snaps valve closed in a fraction of a second. *Valco, Inc.*

RUBBER PRODUCTS for industry

Molding • Specialties • Solids • Roll Covering • Pipe Lining • Tank Lining Coatings • Custom Work

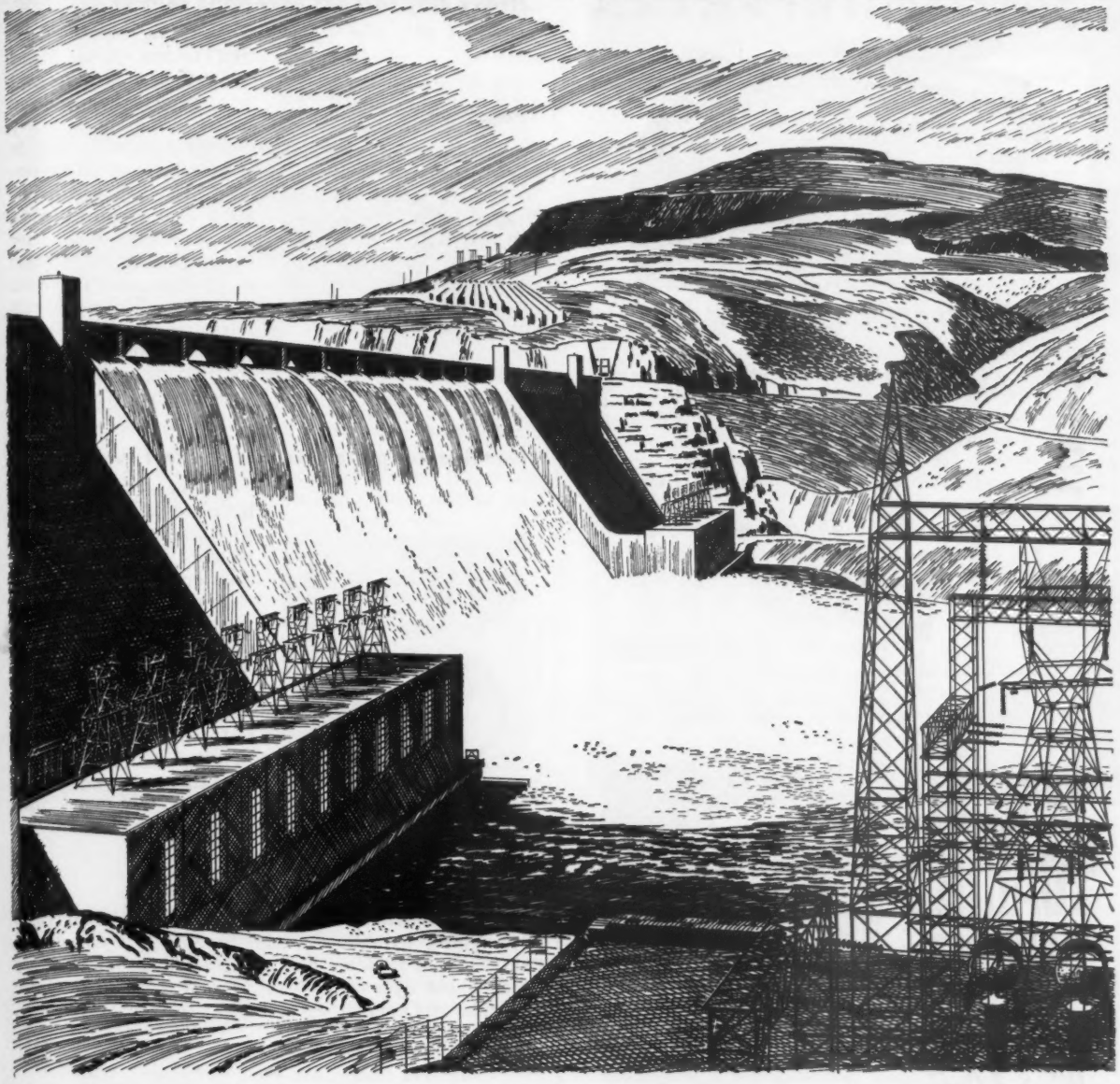
"If It's Rubber We Can Make It"

Write for literature and prices. Dealerships available in selected areas.

HOLZ TIRE & RUBBER CO.

1129 S. SACRAMENTO STREET • PHONE 9-4771 • LODI, CALIFORNIA

Columbia-Geneva STEEL AT WORK IN THE WEST—Grand Coulee Dam, world's largest concrete structure



CONCRETE COLOSSUS...with a backbone of steel!

Begun in 1934, Grand Coulee Dam, the world's greatest producer of hydroelectric power, will eventually supply irrigation water to one million acres of rich, new land in the Columbia Basin area.

Support and strength for Grand Coulee Dam's more than 10 million cubic yards of concrete is 45,000 tons of reinforcing steel, an important share of which came from the mills of Columbia-Geneva.

For any job, big or small—Columbia-Geneva for years has made steel of many types. Of course, some of these products are in short supply. But we hope that when you need steel, you'll continue to look first to Columbia-Geneva, Western producing member of the industrial family that serves the nation—United States Steel.

West's Largest Steel Producer **COLUMBIA-GENEVA STEEL**

Division United States Steel Corporation

USS

UNITED STATES STEEL

SURETY'S SILVERTEX

TOUGH COATING for TOUGH JOBS

Laboratory tests and Industry use show:

- Better chemical resistance than rubber or standard synthetics.
- Silver coating reflects moderate heat radiation.
- Resists cuts and snags.
- Won't crack or peel with use.
- Curved finger design, swing thumb, all standard sizes, styles.

Write for complete information.

THE SURETY RUBBER CO. CARROLLTON, OHIO

H. A. MAC INTOSH—Sales Representative

WESTERN DIVISION
544 MARKET STREET, SAN FRANCISCO 4, CALIF.

MULTIPLY LOADING CAPACITY *without Capital Cost!*

Increase loading capacity over present levels, without adding a single new facility! Meet the demand for stepped up shipping and receiving flow by installing Magliner dock boards. Of all-magnesium construction, these low-cost units are easily handled by one man . . . capacity rated to handle the heaviest of loads and equipment! Establish a rapid transit bridge-link from freight carriers to plant—keep materials and merchandise moving on schedule! Get the facts on Magliner dock boards today. Available in 34 standard models, or custom engineered to exact specification.

MagLiner
MAGNESIUM DOCK BOARDS

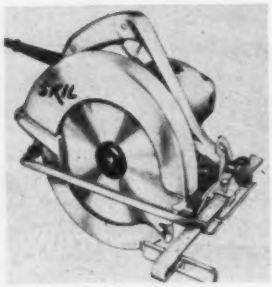
Write Today for Bulletin DB-204
or See Your Local Representative

Magline Inc. • P. O. Box 402 • Pinconning, Michigan

W. T. Billard, Inc., Los Angeles; Equipment Supply Co., Salt Lake City, Utah; Hathaway-McCartney Engr. & Supply Co., Denver Colo.; Lift Truck Service Co., Spokane, Wash.; Material Handling Equip. Co., Inc., Seattle, Wash.; Oregon Handling Equip. Co., Portland, Ore.; Homerslag Equip. Co., San Francisco.

53

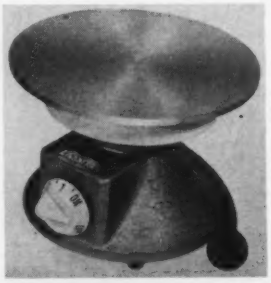
Heavy duty saw has easy hand control



New, big capacity saw, Skil builders 8¼-in., Model 698, will be of great interest to carpenters, builders, and others requiring a heavy duty, big capacity saw. It features a powerful universal motor, ball and needle roller bearing construction, overhead type handle for easy one-hand control, built-in rip fence, and automatic telescoping blade guard with retracting handle. Weighing 14¼ lbs., Model 698 is ideal for framing on home construction. *Skil Corp.*

54

Portable hot plate cuts cost of short runs



An inexpensive portable hot plate, called Pyrodisc, is specifically built for small volume hot plate work. Sheathed nichrome heating elements are cast into aluminum top plate which is said to insure quicker heating (750-deg. in 35 min.), good uniformity, and long element life. "Stepless" control permits precise control of temperature. Terminals are protected from spillage and short circuits. *Lindberg Engineering Co.*

55

Compound replaces hydrofluoric acid

A new powdered product, called Actane 33, in many cases will replace hydrofluoric acid. Because of its powdered nature, there are fewer hazards in handling than there are with liquid hydrofluoric acid. Product contains soluble fluorides and penetrating and dispersing agents. *Enthone, Inc.*

56

Tru-edge shear comes in giant size

New Wales giant model Tru-edge shear is designed for contour and straight inside and outside shearing, beading, louvering and joggling. It has a capacity up to 9/32-in. thick mild steel. A new shearing principle eliminates resistance to feeding and turning work, and feeding of material may be started while ram is operating. Inside cutting requires no starting holes. *Wales-Strippit Corp.*

57

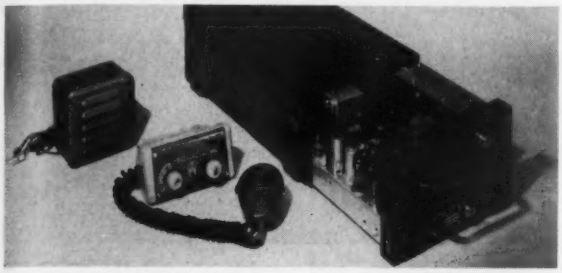
No gears to shift, no clutch to throw

Demand for power steering is spreading to fork lift trucks. This, plus a torque-converter drive that eliminates

gear shifting when operating lift trucks, added up to a show-stopper at recent National Materials Handling Exposition. Both innovations are taken care of by *Towmotor Corp.*

58

Mobile two-way radios operate on 6-12 volt power

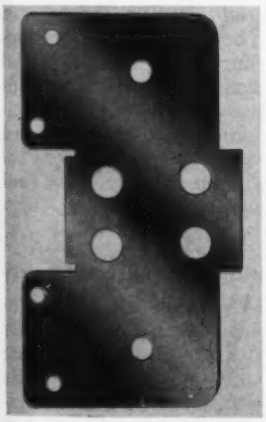


Motorola Inc. adds several mobile models to its line of 25-54 mc. FM two-way radio equipment. These new 30- and 60-watt models feature innovations such as universal 6-12 v. DC operation, dual interrupter vibrator power supply and reduced primary power drain. They may be used interchangeably in 6- and 12-volt vehicles without revision of internal wiring. All power conversion is accomplished automatically in external cabling and connectors.

Use rip-out postcard for more information

59

To simplify hole-punching



An improved multiple hole punching process, with a nearly double blank size range, is designed specifically for short run stamping operations. Multiple holes of varying diameters can now be punched simultaneously from any stampable material. Process reduces number of press runs with consequent savings in time and labor. *Federal Tool & Manufacturing Co.*

60

Coating for smooth surfaces comes in colors

For use as a protective coating on smooth surface asphalt roofs and metal surfaces, Laykold Fibrecoat, a compounded asphaltic emulsion with a mica filler, is available in three colors: red, green or black. Because it is "mineral-armored" and "mineral-bonded," material is said to stop moisture penetration and withstand severe weathering and oxidizing conditions. *American Bitumuls & Asphalt Co.*

61

Fork-lift trucks like autos now

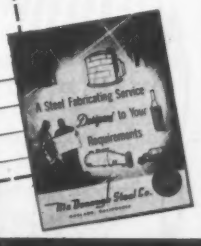
Hydratork drive for gas-powered fork-lift trucks is a new automatic transmission which makes it possible to operate a gas-powered fork-lift truck with same three simple controls as used to operate an automobile, namely an accelerator, a brake pedal and a forward-reverse selector lever

Petro-Chem Heater located at the Oleum Refinery of Union Oil Company of California. Designed to handle 19,500 barrels of crude oil per day. External diameter: 19 feet. Total height:105 feet.

Engineering in Steel

Here is another completed job now in the extensive photo files of McDonough Steel Company. In these files can be found pictures of steel fabricating work for practically every field in Industry—Food Processing, Chemical, Construction and many more. There's the general steel fabricated plate work of stacks, breaching, ducts, hoppers and bins as well as the special, exacting job which requires sound engineering and complete manufacturing facilities. Whatever your needs—large or small—we would like to show you more of the products we have manufactured. Send today for our new pictorial booklet. There's no obligation.

McDONOUGH STEEL CO.
800-75th Avenue, Oakland 21, California
Please send your newly published booklet
NAME
FIRM
ADDRESS ZONE STATE
CITY



CABLE ADDRESS "BOITANCO" OAKLAND
McDonough Steel Co.
Founded January 1st 1924
ENGINEERS - FABRICATED STEEL PRODUCTS
800 - 75th AVENUE OAKLAND 21, CALIFORNIA
TRINIDAD 2-3300

keep production materials moving with

ELECTROLIFT WORM DRIVE HOIST

Safer, smoother, faster action features of ElectroLift will keep your materials and loads moving economically. One-man, quiet operation. Wide selection of speeds, capacities and controls.

For further information consult your ElectroLift representative listed in telephone directory.

ELECTROLIFT

ElectroLift, Inc., 30 Church St., New York 7, N. Y.

Let us...
IRON OUT YOUR PRODUCTION BOTTLENECKS
MATCHING PARTS CAST TO FIT
MINIMIZE HOLE DRILLING
INTRICATE SHAPES AND DETAIL
CAST IN PLACE INSERTS AND BUSHINGS

Investigate the money and time-saving possibilities of die castings. Send blue prints or samples today for quotation.

"Member American Die Casting Institute, Inc."

RANGERS DIE CASTING CO.

10828 SO. ALAMEDA STREET, LYNWOOD, CALIFORNIA

located on steering column. Design of this unit eliminates need for a gear shift for high and low gears and a clutch and clutch pedal. *Clark Equipment Co.*

62

Speed-up with plastic ball bearing retainers

Precision bearings said capable of attaining speeds in excess of 100,000 rpm. are now possible through use of thermosetting laminated plastics. Retainers for machine tools, grinding spindles, aircraft instruments, etc., can be machined within tolerances required for precision and super-precision bearings. Light weight of laminated plastics reduces centrifugal forces resulting from high speeds. *Synthane Corp.*

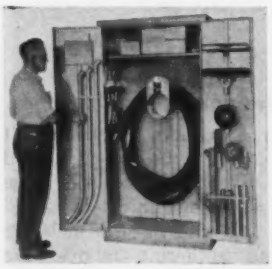
63

Carbide-tipped blades reduce down-time

A new line of low-cost carbide-tipped saw blades, designed for use with radial saws are said to reduce machine down-time and eliminate common blade problems in a number of industrial cutting operations. They are suitable for shipping rooms in crating and similar operations and for use on cut-off saws in furniture plants and pattern shops. *Delta Power Tool division of Rockwell Manufacturing Co.*

64

Cabinet keeps vacuum cleaning hose out of the way



A new hose and tool cabinet specially designed for storing vacuum cleaning hose and cleaning tools meets need for a better system of accessories storage by users of industrial vacuum cleaning equipment. With a centrally located cabinet for utility and convenience, cleaning nozzles and tools can be easily replaced when not in use. Tools are protected from damage and loss, and plant housekeeping is improved. *U. S. Hoffman Machinery Corp.*

65

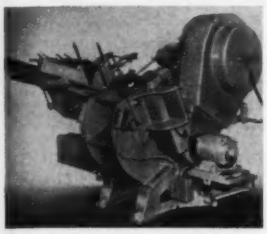
Aerial grinder is new workhorse for industry

New Mall aerial grinder, available in three grinder sizes, is called a "workhorse" for industrial workbench or pro-

duction in welding shop, foundry, or auto body shop. Aluminum alloy housing cuts non-operative weight to a minimum. Ball bearings are used throughout this tool. Commutator and switch are fully enclosed to keep out dust and shop grit. *Mall Tool Co.*

66

For high speed production of light stampings



Hamilton No. 401 strip feed press for high speed production of cam ends, screw caps, and other light stampings is redesigned to increase speed with multiple dies. Continuous feed stack provides for one hour production run before reloading. Machine's rated capacity is 25 tons. Features include an improved frame design using a welded steel structure by means of which perfect alignment is said to be maintained without tie bars. *Baldwin-Lima-Hamilton Corp.*

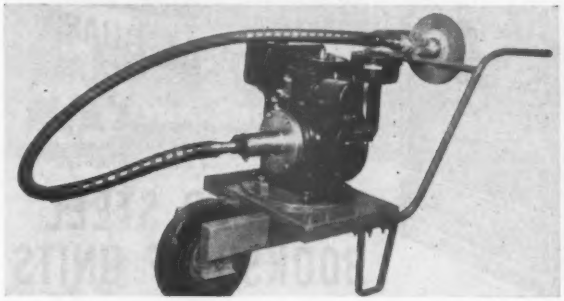
67

New approach to engine lathe operation

"Marvic," it is claimed, tends to put engine lathe operation on a productivity basis comparable with turret lathe operation. System consists of a four-faced block and five basic tool holders. Four faces of this Marvic block permit machinist to work closer to chuck or tailstock. Boring, drilling, reaming and tapping are said to be accomplished with perfect alignment. Lathe's full swing may be utilized. *Abbott Kimball Co.*

68

New mobile grinder operates by gasoline

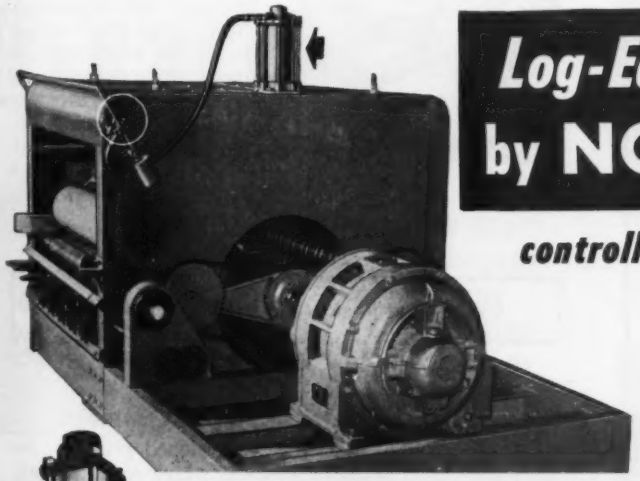


A new gasoline engine powered flexible shaft grinder, Model DGX-7, is especially designed to eliminate need for air compressors. It is also for use where electric power is not available for grinding, rotary filing and other cutting or finishing operations. Unit consists of a 5-hp. gasoline engine mounted on a wheelbarrow type truck. *Franklin Balmar Corp., N. A. Strand division.*

69

A maintenance-free industrial fan

"Install 'em and forget 'em," is slogan of a new deluxe line of industrial fans offering completely maintenance-free operation. Principle is installation of sealed, lifetime-lub-

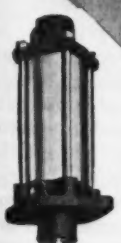


Log-Edger Feed-Rolls lifted by NOPAK Cylinder

controlled by NOPAK 3-Way Air Valve

This Pacific Coast type log edger, manufactured by Albany Machine & Supply Co., Albany, Ore., employs an 8" NOPAK Model "D" Single Acting Air-Cylinder to lift the heavy feed-rolls by means of lever arms. This permits feeding of various sized cants as required. The cylinder is actuated by a 3/4" NOPAK, 3-Way Air Valve, equipped with lever extension-bar enabling the operator to manipulate it from any point in front of the machine. Weighted valve lever, when released, lowers rolls to "feed" position. Heavy springs prevent the feed rolls from dropping full length of cylinder stroke when machine is "empty."

This comparatively simple application may suggest how you can employ NOPAK Valves and Cylinders in your plant or product to actuate and control machine movements.



NOPAK Model "D" Air Cylinder for Right Angle Flat Base Mounting, Rod End.

Refer to Sweet's File for Product Designers or write for Bulletin SW-1.

GALLAND-HENNING NOPAK DIVISION
2766 S. 31st STREET • MILWAUKEE 46, WISCONSIN

NOPAK
VALVES AND CYLINDERS
DESIGNED for AIR and HYDRAULIC SERVICE

Pacific Coast Representatives

Transmission Engineering Co., 53 Stevenson St., San Francisco 5, Calif.
The Willard Engineering Co.....218 W. 28th St., Los Angeles 7, Calif.
J. M. O'Brien.....32 North Holman St., Portland 11, Oregon
E. C. Griffin Company.....524½ First Ave. South, Seattle 4, Washington

A 7466-½HA

TRIM *and* ORDERLY

as the ROYAL GUARD!

The "order of the day"—every day—is "neatness" by the installation of these sturdy, attractive

BERGER STEEL BOOKSHELF UNITS

OTHER PRODUCTS
Steel shelving, tool room equipment, steel lockers, office desks, work benches, files, tables.

1 Rugged construction for lifetime strength.
2 Slotted uprights for flexible adjustability to different sizes of books.
3 Single or double faced assemblies, with closed backs or sway braces, with or without end panels.
4 Choice of platinum gray, olive green, mahogany or walnut.
5 Green and gray units available from local stocks.

Representatives:
BERGER MFG. DIVISION
REPUBLIC STEEL CORPORATION

PETLEY INCORPORATED
INDUSTRIAL AND AUTOMOTIVE EQUIPMENT ENGINEERS

899-73rd Ave., Oakland 3, Calif.
Phone: TRinidad 2-7621

5424 E. Slauson Ave., Los Angeles 22
Phone: UNderhill 0-3327

Anglo Bank Bldg., Fresno, Calif.—Phone: 3-4849

A REVOLUTIONARY DEVELOPMENT THAT SAVES TIME, LABOR, FATIGUE

Provides complete rotation of 360° in any direction. Positions work to the operator saving time, labor and physical fatigue. Flexivise is exactly what the name implies: a flexible vise providing a greater range of uses, with more convenience and greater efficiency. 4" jaw width, 5½" jaw opening. Write or wire now for complete information.

Typical example of extensive flexibility.

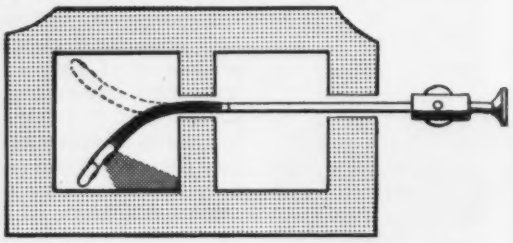
Flexisleeve attachment permitting work to be rotated in any position.

FLEXIVISE COMPANY
1149 E. Pico Blvd. · Los Angeles, Calif.

ricated ball bearings in both fan and motor so that no lubrication of any type is required. Deluxe line of industrial fans is an addition, not a replacement in this manufacturer's line. *Murray Co. of Texas, Inc.*

70

Production problems solved with a doctor's instrument



Just as a doctor examines inner workings of his patient with a gastroscope, production men now place an "Inspectroscope" along narrow passages and into molded cavities. This thin tube fits through a ½-in. opening and contains a complex set of tiny lenses which reflect images back to inspector's eye. A strong light illuminates area examined. A control wheel on handle curves tube to fit around corners. *Eder Instrument Co.*

71

Di-profiler works carbide dies

According to manufacturer, tungsten carbide dies can be repaired, altered and even produced, from blanks of pre-sintered carbide by using new Nord di-profiler. Operation is said to be vibrationless, even when used at long stroke which may be adjusted from 0 in. to .250 in. Reason for this accuracy is in full ball bearing construction and eccentric balancing construction of high precision. *Nord International Corp.*

Use rip-out postcard for more information

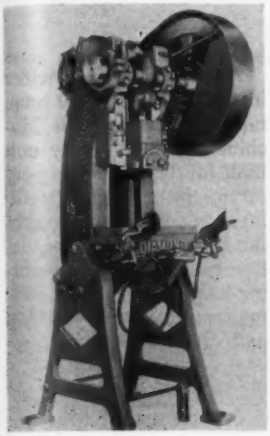
72

High capacity roller bearing is a light-weight

Developed primarily for today's high speed aircraft, this self-aligning, torque tube type, double row roller bearing is said to provide full freedom of rotation under all conditions of misalignment resulting from mounting inaccuracies and usual flexing of airframe structural members during flight. Bearing is factory-lubricated and equipped with positive seals which retain lubricant and prevent air loss in pressurized aircraft. *Shafer Bearing Corp.*

73

15-ton punch press improved for safety's sake



Continuous or single stroke operation is now available on redesigned Diamond 15-ton open back inclinable punch press with shut die height of 9 in. Press was redesigned to meet strict safety codes throughout country. Flywheel is completely covered by a metal guard. Frame is of meehanite casting, aged under natural conditions and designed to rigid specifications of strain gauge analysis with radii in proper locations to distribute stress concentrations. *Diamond Machine Tool Co.*

74

Asphalt for cold-storage construction

A heavy-bodied asphaltic emulsion, made from high-ductility, plasticized base-asphalts, is applied cold, eliminating cost of heating equipment. Called Laykold insulation adhesive, it is compounded without use of fire-hazardous petroleum solvents, water-absorbent clays, or other type fillers which could cause re-emulsification. Before setting, this odorless material is buttery in consistency, suitable for easy spray or brush application without sagging during setting period. *American Bitumuls & Asphalt Co.*

FLEXCO® **BELT FASTENERS and RIP PLATES**

FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

★ FLEXCO Fasteners make tight butt joints of great strength and durability.
★ Trough naturally, operate smoothly through take-up pulleys.
★ Distribute pull or tension uniformly.
★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.

Compression Grip distributes strain over whole plate area

★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO.
4642 Lexington St., Chicago 44, Ill.

ROLLED RINGS and SLEEVES... STEEL
Weldless Carbon, Alloy and Stainless
72" and 40" Ring Mills
CBS STEEL & FORGE
3321 E. Slauson Ave. • Los Angeles 58 • LA 0147

ROLLED RINGS and SLEEVES... ALUMINUM
To Your Specification
72" and 40" Ring Mills
Electric Forging Furnace Facilities
CBS STEEL & FORGE
3321 E. Slauson Ave. • Los Angeles 58 • LA 0147

FLAT DIE FORGINGS
Carbon and Alloy Steel; Aluminum
Bar Stock and Shapes
1500 lb. & 7500 lb. *Open Frame Hammers*
CBS STEEL & FORGE
3321 E. Slauson Ave. • Los Angeles 58 • LA 0147

PRESS FORGINGS
Carbon and Alloy Steel; Aluminum
1200 Ton Maxi; 350 Ton Hydraulic
1500 Ton Hydraulic (now being installed)
CBS STEEL & FORGE
3321 E. Slauson Ave. • Los Angeles 58 • LA 0147

DROP FORGINGS
Carbon and Alloy Steel; Aluminum
4000 lb. and 6000 lb. Drop Hammers
Electric Forging Furnace Facilities
CBS STEEL & FORGE
3321 E. Slauson Ave. • Los Angeles 58 • LA 0147

POWERS

DIAL THERMOMETERS

Help Cut Costs—

VARIETY OF RANGES

For more accurate temperature readings and improved efficiency use POWERS Dial Thermometers. They're vapor pressure actuated. Have 4" dials with either rigid stem for use in pipe lines and tanks or flexible tubing type for conveniently showing the temperature at a remote point. (DT)

▶ ***WRITE FOR BULLETIN 355*** • **THE POWERS REGULATOR CO.**

PACIFIC COAST OFFICES:
Los Angeles 5, Calif., 1806 West 8th Street; Portland, Oregon; San Francisco, Calif.; Tacoma, Seattle 1, Washington, 2800 - 15th Ave. W.

SWEEPS 45,000 SQUARE FEET PER HOUR!

"MODERN" INDUSTRIAL POWER SWEEPER

- Easy and economical to operate
- Picks up any material from grass to tin cans
- Sweeps 36" wide path
- Equipped with dust control unit
- Brush height adjustable to sweeping requirements
- Riding sulky and gutter brush attachments optional
- 100% steel construction

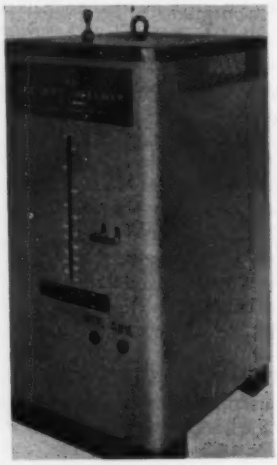
Write today for free literature WI-1

MODERN MANUFACTURING CO.

160 NO. FAIR OAKS AVE. PASADENA 1, CALIF.

75

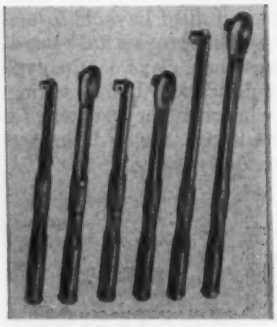
New DC rectifier welder with heavy-duty build



A new DC rectifier welder in 200, 300 and 400 amp. ratings is now available. Machine is a heavy duty unit built for day in and day out service in production welding. Its design incorporates fan-forced, up-draft ventilation providing cool operating temperatures and assuring long rectifier life. *Metal and Thermit Corp.*

76

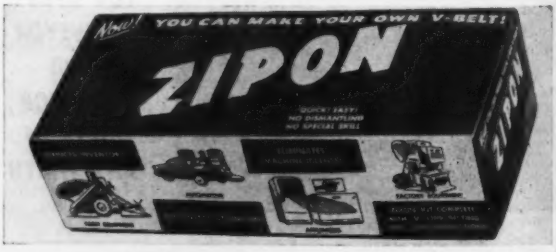
Inch-pound torque-limiting wrenches



Plomb Tool Co. adds six Proto torque-limiting wrenches that are calibrated in inch-pounds. Capacities of these wrenches are 100-750 and 700-1,600 inch-pounds. Three models have a plain head and three have a built-in reversible ratchet head. Drive sizes are ⅜ in. and ½ in. Availability of both inch-pound and foot-pound models is said to provide suitable torquers for repair, installation, assembly and inspection work in nearly all types of industries and mechanics.

77

New V-belt kit for emergencies



With use of new Zipon emergency V-belt kit, broken V-belts can be replaced quickly without dismantling machinery. With four kits of various size belting, you can replace all FHP and nearly all multiple V-belts. Each kit contains a carefully planned footage of detachable V link belting, a simplified tool for attaching, and a folder of instructions. *Brammer Corp.*

78

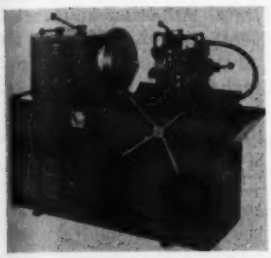
Pipe identification system

An easily installed pipe identification system that is said to require no protective coating, cleaning or maintenance, uses labels, custom-made, of Vinylite plastic rigid sheet. Rolled label is easily spread by hand and allowed to spring closed around pipe. Colored and worded to fit exact re-

quirements, label fits any size pipe up to 30 in. in diameter and is easy to read at a distance and from any angle. *Wilmington Plastics, Inc.*

79

Pipe threader in low-cost field



The Oster Manufacturing Co. now offers to industry a new low cost, four-in. pipe machine, No. 784 "Thrift Model." Unit is a heavy duty, fabricated steel constructed floor type machine, with standard range of one to four in., and an extra range of ½ and ¾ in. It is equipped with a front chuck which requires no wrench for operation, and is said to be ideal for frequent changes of pipe sizes since a hand wheel spin moves gripping jaws through entire range in a few seconds.

80

For cleaner metals

A metal cleaner, especially formulated for use in vitreous enameling industry, is a new development of *Detrex Corp.* Trade-named Detrex 63, this cleaner is described as a medium-high alkaline compound containing high wetting and penetrating properties. It is said to have exceptional ability to emulsify large quantities of mineral oils and keep them in a state of suspension.

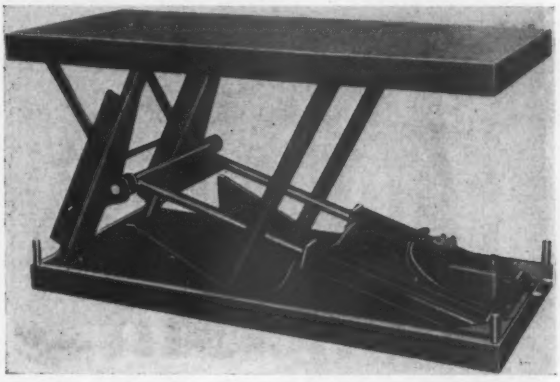
81

A fitting expansion

Long and extra long male elbows made in steel, are added as standard stock items in Triple-lok line of industrial tube fittings. Designers will have greater flexibility in planning tube circuits with these new additions. Long and extra long elbows allow work within closer space limits. While standard stock is steel, these two shapes are available, on special order, in brass, stainless steel, and aluminum. *The Parker Appliance Co.*

82

Table offers from 30½ to 34 in. of usable lift



This hydraulic lift table, in its extreme lowered position, measures 12½ in. from floor to top, and it can be made to achieve an absolute minimum lowered height of 9 in. by displacing hydraulic pump unit to a platform attached outside unit. It can be raised to 43 in. and comes in standard

On the lookout for local manufacturers?

The answer's in the YELLOW PAGES!

The easy way to find the people who make the products you need—is right at your fingertips, in the handy Yellow Pages! There—in convenient "Classified" listings you'll find names, addresses, phone numbers, ready to get action for you...in a hurry.

You'll find it fast in the YELLOW PAGES!

Pacific Telephone

What It's Like In A Bubble Tower . . . MERIAM MANOMETERS Reveal

Front and back views of an instrumentation cell indicate the exhaustive studies of bubble tray design made by C F Braun & Co, Alhambra, Calif., leading engineers and constructors for the petroleum, chemical and metals industries.

As part of a series of critical tests in bubble tray development, at the C F Braun & Co Research Center, these Meriam Manometers secure the following vital information:

1. Pressure differential across bubble trays.
2. Depth of liquid on individual trays.

If you require primary standards of measurement for pressure or flow of liquids or gases, there is a Meriam Instrument to do the job accurately, quickly and at low cost. We shall be glad to share our more than 40 years of experience in instrumentation with you. Ask for Catalog C-12.

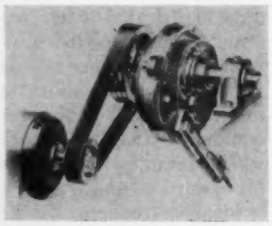
THE MERIAM INSTRUMENT CO.
10988 Madison Avenue • Cleveland 2, Ohio
WESTERN DIVISION: 4760 E. OLYMPIC BLVD., LOS ANGELES 22, CALIF.
IN CANADA: PEACOCK BROS., LTD., MONTREAL

MERIAM Instruments
ESTABLISHED 1911
MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

4,000- and 10,000-lb. capacity models with dimensions of 36 in. wide and 84 in. long. Table offers from 30½ to 34 in. of usable lift. *Beacon Machinery, Inc.*

83

New series of Shaft-King



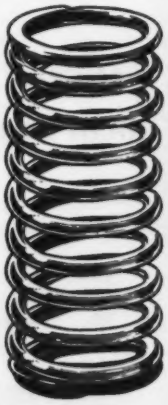
Under name of "Shaft-King," a new 13-to-1 ratio series of shaft-mounted speed reduction units is introduced which retains all advanced features of original 20-to-1 series and extends advantages of V-belt drives to cover a wide variety of slow-speed equipment. Claimed adaptable to any shaft size up to 3-15/16 in., these speed reducers are compact and require only standard shaft lengths to be mounted directly on shaft of driven machine. *American Pulley Co.*

84

To make iron and steel come clean

Oakite composition No. 26 is a heavy-duty cleaner combining alkaline and solvent cleaning action that is claimed to remove difficult soils from iron and steel in one operation. This eliminates need for separate precleaning and alkaline cleaning procedures. This detergent will be welcomed by those who have trouble with heavy pigmented drawing

For precision springs in any quantity... call Connor



• Here at Connor we all recognize that performance is the important thing in springs, whether they be ordered in large lots or small.

You'll find that we're more concerned with turning out springs that meet your specifications than we are with the length of the run.

No matter what the quantity, when you need precision springs give us a call. All our facilities are at your service.

CALL CONNOR
CONNOR SPRING Manufacturing Co.
SAN FRANCISCO 3 • LOS ANGELES 37
Precision Springs and Wire Forms
San Francisco: UNderhill 3-4222 Los Angeles: ADams 3-5278

compounds, buffing compound residues, dried-on Crater's compound, etc. *Oakite Products, Inc.*

Use rip-out postcard for more information

85

Savings and satisfaction go with this steam cleaner

New "JO" Hypressure Jenny steam cleaner features maximum utility through easy movement on its 16 x 4-in. rubber-tired wheels, and extra-heavy-duty welded steel chassis. Road-building and construction contractors, factories, hatcheries, poultry, livestock and dairy farms will find this new unit particularly useful, because of its ability to roll over rough ground. Its nozzle control system is said to save fuel, chemicals, water, and time by permitting operator to start and stop unit at cleaning job, 100 ft. or more from Jenny. *Homestead Valve Manufacturing Co.*

Pipe it...
— AND AVOID TODAY'S HIGH COST OF MATERIAL HANDLING

Screw-Lift is a tubular conveyor that can be installed to convey any free-flowing bulk material from truck or track hopper to processing or to storage—then back to processing or other movement.

The term "conveyor" doesn't fully describe the functions of Screw-Lift—for Screw-Lift is "equipment" that can form a definite part of your processing machinery—recycling materials (such as starch in a candy mogul) or flours to and from mixing vats, to storage for packaging, etc. It is a precision-built conveyor furnished in specific lengths, each running in patented bearings and always in perfect alignment. Other patented features prevent distortion or whip. Materials never suffer degradation or exposure. Intakes and discharge are arranged to suit conditions. Feed can be any length . . . height wherever you want to go within practical limits. (We've gone beyond 96 feet.) No manual attention necessary — costs are licked from the start.

Screw-Lift
A COMPLETE CO-ORDINATED CONVEYING AND RECLAIMING SYSTEM IN A TUBE

Learn how Screw-Lift has simplified the movement of bulk materials in hundreds of plants. Capacities up to 3000 cu. ft. per hour. Write for Form M-500-2.

Screw Conveyor Corporation
HAMMOND, INDIANA
ENGINEERS HAMMOND PRODUCTS MANUFACTURERS

THE MAN ON THE JOB
likes Victor adaptability!

250 lbs. of VICTOR No. 1 bronze rod and 80 man hours of welding repaired this 10-ton, $10,000 gyratory crusher casting at West Coast Welding Company, Oakland, California. Job was done with VICTOR No. 310 welding torch butt with No. 320 extension and No. 10 and No. 12 Multiflame nozzles.

Whatever the job . . . welding, cutting, heating, brazing, descaling . . . you'll start it quicker, finish it sooner with versatile VICTOR equipment.

Here's why:

- HAND-TIGHT QUICK-CHANGE nozzles and cutting attachments are on or off with a twist of the wrist —no wrench needed!
- STEADY FLAME—set VICTOR torch ball-point control valves to the flame you want and it *stays!*
- EFFICIENT MIXING in VICTOR'S exclusive spiral mixer and gas proportioner means peak performance at every setting, with every type of VICTOR nozzle.

VICTOR

LOOK FOR THE VICTOR DEALER SIGN

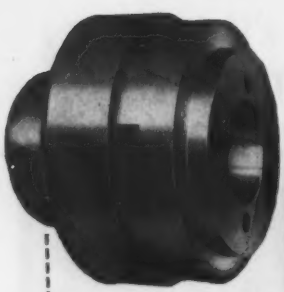
Ask him to show you why it *pays* to standardize on VICTOR.

GET THE FACTS—AND YOU'LL GET VICTOR

302

VICTOR EQUIPMENT COMPANY

3821 Santa Fe Ave. LOS ANGELES 58 | 844 Folsom Street SAN FRANCISCO 7 | 1312 W. Lake St. CHICAGO 7



new...

LOVEJOY CIF COUPLING

CIF Couplings: 1 to 64 hp. at 100 rpm. . . max. bore 1⅝ to 5⅞.

★ **COMPACT**—fits right into the flywheel . . . saves space required by conventional hub length.

★ **ECONOMICAL**—elimination of one flange affords cost saving over standard flywheel couplings

★ **MAINTENANCE FREE**—cushions changed without shutdown . . . no lubrication required

LOVEJOY Flexible Couplings provide maximum alignment correction, extra-smooth power transmission . . . absorb vibration, starting torque and shock of intermittent loads . . . assure optimum motor and machine performance. Cushions are made of materials best suited to load conditions.

There's a LOVEJOY Flexible Coupling for every requirement.

Write today for Catalog and Handy Selector Charts

FACTORY REPRESENTATIVES—Walter H. Ostring, 1149 E. Pico Blvd., Los Angeles 21, Calif. • Edward L. Parsons, 800 Sixteenth St., Oakland 12, Calif. • Chain Gear, Inc., 822 First Ave., So., Seattle, Wash.

LOVEJOY FLEXIBLE COUPLING CO.

5092 WEST LAKE STREET CHICAGO 44, ILLINOIS

Mfrs. of Flexible Couplings, Universal Joints, Variable Speed Transmissions, and Variable Speed Pulleys.

Do YOU Want...

- To sell, rent or buy good used equipment?
- To sell, lease or buy good industrial property?
- To get subcontracts with your manufacturing facilities?
- To fill or get a good job?
- To advertise an auction?
- To offer or obtain some special service?

For rates see Page 115

FOR ACTION USE THE WI CLASSIFIED SECTION!

Send your copy NOW to

609 MISSION STREET • SAN FRANCISCO 5, CALIF.

86

Crane scale guaranteed accurate

A. H. Emery Co. now offers industry a newly designed crane scale on which firm guarantees accuracy to within 2/10 of one per cent of its capacity. A 25% tare weight adjustment is provided, and complete zeroing is assured. Tare adjustment control moves needle rather than dial, and a one-piece housing offers protection against usual rough handling of industrial equipment. Scale is offered in 1,000, 2,000, 5,000 and 10,000-lb. ranges for delivery on short notice.

87

Little rectifier does a big job

My-T-Midget rectifier, made by *American Rectifier Corp.*, is a small, self-contained unit which provides DC from an AC source. This compact box, which plugs into an AC outlet, is said to eliminate necessity for discarding small DC-operated machinery when power source is changed from DC to AC. It is a practical DC source for magnetic chuck and applications. Device is supplied in a crackle-finish cabinet that can be mounted next to machinery or on a wall.

88

Solution for maintenance and down-time of industrial trucks

Quickly interchangeable power units, either gas-electric or diesel-electric, will simplify preventive maintenance and minimize down-time of your industrial trucks. A single power unit in excess of number of trucks operating allows maintenance on a rotational basis, and permits trucks to remain in service. *The Ready Power Co.*

SULPHURIC ACID
for the west
66° BAUME 20% OLEUM
98%
and special grades

Garfield CHEMICAL & MFG. CORP.

ESTABLISHED 1916

700 PACIFIC NAT'L BLDG. SALT LAKE CITY, UTAH

WESTERNERS AT WORK

California

DR. JOSEPH M. TRICKETT joins *Food Machinery and Chemical Corp.* as coordinator of management development activities. He was formerly associate director of management education study for *American Management Association,* New York. Prior to that he was for six years vice president of Golden Gate College, San Francisco, and at one time director of organization planning for *Columbia Steel Co.*

E. M. TOUSSAINT becomes first general manager of Appliance Controls division, *Minneapolis-Honeywell Regulator Co.,* with headquarters in Los Angeles. Before assuming this newly created post, he was assistant to Honeywell's vice president in charge of manufacturing.

D. L. BOHON is appointed West Coast manager of *DeVilbiss Co.,* succeeding CHARLES E. FOSLER, retired.

DAN A. KIMBALL, former Secretary of the Navy and at one time General Tire manager for the Pacific Coast, is picked for presidency of *Aerojet Engineering Corp.,* subsidiary of *General Tire and Rubber Co.*

FRANK WARGA is promoted to new post of general foundry foreman of *AiResearch Manufacturing Co.,* Los Angeles, in charge of aluminum foundry at main plant and new steel foundry near South Pasadena. His former position was foreman of aluminum foundry.

GEORGE SCHUMANN is appointed chief consulting design engineer, newly created position, at *Kaiser Engineers,* division of *Henry J. Kaiser Co.* F. B. TOBIAS succeeds him as chief design engineer. JACK W. WALLING becomes manager of industrial relations, leaving post of assistant to vice president of operations at Fontana Works of *Kaiser Steel Corp.*

W. E. LOVEJOY becomes assistant to manager in safety division of personnel department, *Standard Oil Co. of California,* transferring from post of personnel supervisor, *California Research and Development Co.*

Rockwell Manufacturing Co. advances FLOYD V. SNODGRASS to special administrative post involving supervision of production and operations at Oakland. He is replaced as

W. D. Willes

F. V. Snodgrass

general manager of *Nordstrom Valve Division* plant, Oakland, by W. D. WILLES, formerly general manager of company's Barberton, Ohio, plant.

E. W. FICHTER, chief industrial engineer at Los Angeles plant of *Owens-Illinois Glass Co.,* is transferred to Oakland plant in same capacity, succeeding TOM LAMPMAN, who goes to Pacific Grove sand plant as plant manager. ABE MARTIN, JR., from manufacturing department in San Francisco, goes to Los Angeles to take Fichter's old spot.

GERARD E. BALSLEY joins *Kaiser Steel Corp.,* Fontana, as director of industrial relations, and CHARLES M. HEATH is appointed as assistant director. MARTIN B. WESTERMAN becomes assistant director of labor relations. MAX LAUDERBACK assumes duties of metallurgical superintendent, and WILLIAM DEPEW fills newly created post of superintendent in charge of quality control. JAMES P. WILLIAMS becomes assistant general superintendent at Fontana plant, supervising plant engineering, quality control, traffic, industrial engineering and production planning.

ARTHUR ROBERTSON joins *Longren Aircraft Co.,* Torrance, as general manager. He was formerly with *Joshua Hendy Corp.* as plant manager.

DANIEL E. HARRISON is now assistant to W. E. HIRTENSTEINER, general manager of *National Steel & Shipbuilding Corp.,* San Diego, with Al-Fin division management entrusted to his care. He succeeds WOODROW KELLY who has gone into business for himself operating a foundry and machine shop in El Cajon. Kelly continues to serve as *San Diego Manufacturers Association's* secretary.

CARL L. SMART is named executive vice president of *Calstrip Steel Corp.,* Los Angeles, producer of cold rolled strip steel. He has previously served this firm in positions of credit manager, traffic manager, secretary and treasurer, purchasing agent, and vice president.

C. L. Smart

J. H. McVey

The Austin Co. appoints JOHN H. MCVEY, formerly district engineer in Southern California, as its new district manager. He succeeds R. E. WARD who will continue to serve as a company vice president.

ELWELL-PARKER

CATALOGS SALES SERVICE

POWER INDUSTRIAL TRUCKS

FORK LIFT TRUCKS

CRANES

IRA G. PERIN CO.

MATERIAL HANDLING EQUIPMENT

575 HOWARD ST., Dept. C
GArfield 1-1827
SAN FRANCISCO 5

EST. 1920

6829 RITA AVE., Dept. C
Jefferson 3213
HUNTINGTON PARK

Mere payment of premiums does not insure

● It is easy to buy fire insurance but difficult to prove a loss.

When fire occurs *you* must be able to prove what you lost and its cash value.

With Continuous American Appraisal Service, you will always be prepared.

The AMERICAN APPRAISAL *Company*

Over Fifty Years of Service

OFFICES IN PRINCIPAL CITIES

WILLIAM F. KIRK, assistant manager of Economics Department, *General Petroleum Corp.*, Los Angeles, is appointed by Secretary of Interior McKay to post of assistant director of the Program Division, *Petroleum Administration for Defense*. Appointment calls for service in Washington, on a "without compensation" basis. *General Petroleum* names THOMAS P. SIMPSON assistant director of manufacturing. He will transfer from affiliated company, *Socony-Vacuum Oil Co., Inc.*, where he was director of research and development laboratories in New Jersey.

T. P. Simpson

M. W. Christen

MARSHALL W. CHRISTEN, formerly chief engineer of *Connor Spring Manufacturing Co.'s* Los Angeles plant, is promoted to position of assistant plant manager, Los Angeles plant.

JOHN VAN HAMERSVELD is placed in charge of special titanium committee at *Northrop Aircraft, Inc.*, Hawthorne, studying use of titanium in aircraft design. EDWARD M. OWEN is appointed assistant director of military relations and is succeeded as director of the flight department by MAX R. STANLEY, former assistant director. WILLIAM M. STEFFEN, who joined Northrop in April, becomes general supervisor of materials and process engineering. RAY D. GAYNER is new chief project engineer for programs to produce missiles and F-89 interceptors.

CECIL BARDWELL is named general manager of *Bardwell & McAlister, Inc.*, Burbank. He is a co-founder of firm and serves as director and vice president.

L. K. LINDAHL is elected president of *L. H. Butcher Co.*, Los Angeles, subsidiary of *Udylite Corp.* He succeeds W. D. SCHWARTZ, who will retain an advisory status. VICTOR M. SCHWARTZ, former vice president, is named executive vice president and general manager.

ROBERT J. STAHL, formerly chief engineer of *Color Television Incorporated*, becomes consulting engineer at *Dalmo Victor Co.*, San Carlos.

ROLAND C. THELIN joins *Kelite Products, Inc.*, as controller. He was formerly senior supervising accountant with *Alexander Grant and Company*.

Colorado

JAMES LOVATELLI resigns as president and general manager of *Fox Metal Products of Denver*.

Colorado Interstate Gas Co., Colorado Springs, names DONALD F. MCMAHON of Denver as its industrial relations manager. He was formerly Denver district representative of *American Petroleum Institute's* public relations division and executive secretary for *Rocky Mountain Oil & Gas Association* at Casper, Wyo.

C. A. HAST is appointed regional manager of *North Pacific Lumber Co.*, with headquarters at Denver.

OTTO DUKE joins *Stearns-Roger Co.*, Denver, to supervise design of copper smelter for *San Manuel Copper Co.*, Tucson, Ariz. He was formerly assistant chief engineer of *Combined Metal Reduction Co.'s* operations at Bauer, Utah.

Nevada

M. E. LUNDBERG is appointed general manager of *Elko Lamoille Power Co.* He has been concern's assistant manager, secretary and treasurer. He succeeds ALLEN G. MCBRIDE, deceased.

New Mexico

Atomic Energy Commission's Santa Fe Operations Office announces two promotions. W. B. CREAMER becomes chief of Santa Fe's personnel branch. He was formerly organization and personnel branch chief at Los Alamos field office. He is succeeded at Los Alamos by JOHN J. BURKE who previously was personnel director at Langley Field, Va.

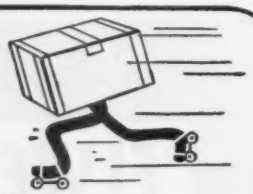
Oregon

EARL BERRY retires from position as superintendent of *Coos Bay Lumber Co.'s* Bunker Hill and Millington mills. He is succeeded by CHARLES MILLETT.

O. W. FROST is named general manager of *Forest Fiber Products Co.* G. E. TOWER succeeds him as plant manager.

Industrial Spray Painting Corp., Portland, elects HAROLD KOPPANG president and general manager; AL T. WESTON vice president and secretary, and FRED HART treasurer and superintendent.

Put your PACKAGES on ROLLER SKATES with Standard Conveyors

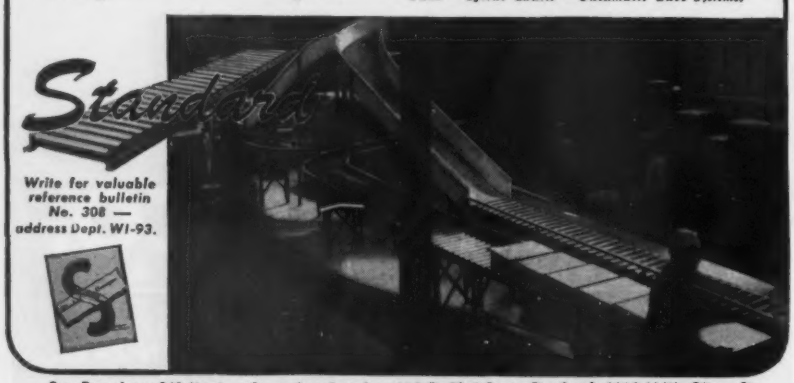


Whatever you have to handle — packages, units, cartons, castings, assemblies — you can keep them rolling — faster — at lower cost with conveyors.

Whatever you need in conveyors — a complete engineered system, a portable, self-contained conveyor unit — Standard is known as headquarters for conveyors — gravity and power, roller, belt, slat, push-bar — spiral chutes — pneumatic tube systems.

Write telling us what you make or handle. We will send literature showing Standard Conveyors at work in your kind of business. Address Dept. WI-93.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minn.
Sales and Service in Principal Cities
Engineered Conveyor Systems — Portable Conveyor or Units — Spiral Chutes — Pneumatic Tube Systems.



Write for valuable reference bulletin No. 308 — address Dept. WI-93.

San Francisco: 840 Harrison St. • Los Angeles: 115 E. 23rd St. • Portland: 1115 N.W. Glisan St. 502 First Avenue South — RUSSELL G. DALEY — Seattle 4, Washington

JOHN L. GROAT becomes executive vice president of *Timber Structures, Inc.*, Portland. He was formerly with *Allied Building Credits, Inc.*, Los Angeles.

JACK LEWIS, former chief production engineer, is appointed by *Hyster Co.*, Portland, to position of vice president in charge of all production.

DOUG MACY resigns from his job as Madras branch manager of *Eastern Oregon Mills*. He may go into business soon. HAROLD LOUGHEAD, formerly Eastern Oregon Mills field representative, replaces him at Madras.

Utah

J. CARLTON WARD, JR., is elected president of *Vitro Chemical Co.*, Salt Lake City.

Salt Lake Tungsten Co., Salt Lake City, new affiliate of *Minerals Engineering Co.* and *Sylvania Electric Products Co.*, names following officers: President, BLAIR BURWELL, president of Minerals Engineering; vice president, E. C. LARSEN, chief engineer in Sylvania's tungsten and chemical division; secretary-treasurer, J. E. MCCARR, controller in same division. M. N. SHAW will be in charge of plant operations.

DENTON L. DUNN resigns as vice president and general manager of *Western States Refining Co.*, North Salt Lake.

Washington

L. G. GERMAIN is named Northwest district supervisor of technical service for *American Can Co.* with headquarters at Canco's Seattle factory. He has previously served in various capacities in firm's research department. He succeeds N. J. WILLETT who transfers to company's technical service laboratory at Maywood, Ill.

CHARLES N. GROSS takes over as manager of *General Electric's* employee and public relations department at Hanford. He succeeds GEORGE G. LAIL who will retire from General Electric Co. in February of next year. Gross is replaced as manufacturing department manager by J. EMMETT MAIDER, JR., formerly production section manager, manufacturing dept.

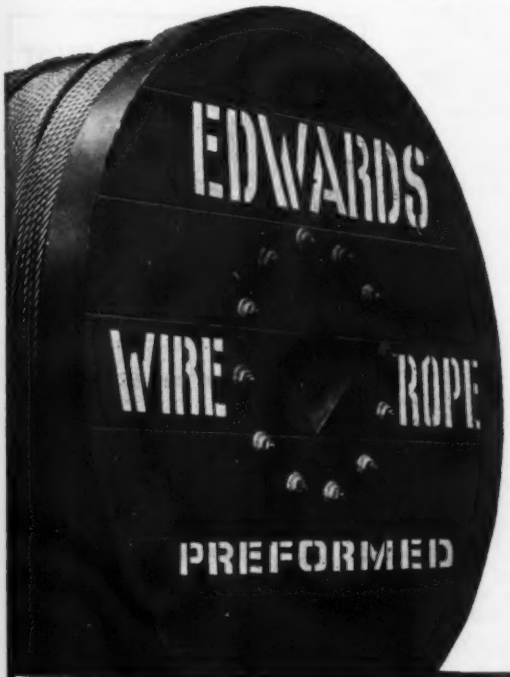
GORDON MCCULLOCH joins *Howe Sound Mining Co.* as electrical, mechanical and maintenance superintendent at Chelan division, Holden. He was formerly power superintendent for *Northwest Magnesite Co.*, Chewelah.

A. G. BISSELL accepts appointment as engineering consultant to *Nelson Stud Welding Division* of *Gregory Industries, Inc.*, of Lorain, Ohio, with headquarters in Seattle. He retired recently after 17 years service in welding, casting and forging branch of Bureau of Ships, U. S. Navy.

PAUL C. BALDWIN, former assistant vice president, advances to vice president of *Scott Paper Co.* He is in charge of company's operations at Everett.

W. D. O'HEARNE is named division engineer at Spokane for *Northern Pacific Railway*. He succeeds J. P. TITUS, named assistant district engineer.

C. H. BACON becomes vice president and general manager of *Simpson Logging Co.*, with headquarters at Shelton. H. O. PUHN is named operations general manager and C. L. EMERGY general sales manager.



Increase the efficiency of your MATERIALS HANDLING EQUIPMENT

Specify **EDWARDS WIRE ROPE**
E. H. EDWARDS COMPANY
General Office: South San Francisco, California
Los Angeles • Seattle • Portland • Houston

YOU NEED THE FACTS

with N.E.M.A. standards change!

New, 64 page
TRI-STATE CATALOG "F"
on insulation, tools, wire and supplies
Gives ALL *information!*
MAIL COUPON FOR FREE COPY NOW!

- Detailed technical descriptions.
- Practical materials applications.
- Maintenance and rewinding substitutions.
- Manufacturer's name and conformance specs.
- Quantity standards & packaging.
- Today's price breakdowns.

Easy to read. Indexed for handy reference. Loose leaf to insert price changes. Full size, 8½" x 11", punched to fit your file or binder.

One call for all — TOP BRANDS

TRI-STATE
SUPPLY CORPORATIONS

Tri-State Supply Corporations, Dept. 49, 544 S. San Pedro St., Los Angeles 13, Calif.
Please send me free copy of your new Catalog "F."

Name_____
Company_____
Street Address_____
City_____ Zone____ State_____

A GENERAL APPRAISAL and GOOD INSURANCE

work hand in hand for GREATER PROTECTION

Accurate insurance coverage requires up-to-date knowledge of values. A General Appraisal provides actual current values on any property appraised... working hand in hand with good insurance for greater protection. We will welcome an opportunity of discussing the advantages of our service with you.

GENERAL APPRAISAL CO.

SEATTLE 408 Marion St. | LOS ANGELES 208 West 8th St.
PORTLAND Terminal Sales Bldg. | SAN FRANCISCO 74 New Montgomery St.

ZURBACH STEEL CO. OF CALIF. INC.
ANGELUS 3-2101
P.O. BOX 6769, LOS ANGELES 22

EVAN M. NELSEN, *Boeing Airplane Co.'s* Seattle division controller, is elected company treasurer, and CLYDE SKEEN, formerly assistant controller, replaces him as controller. JAMES E. PRINCE, administrative vice president, takes on additional job as secretary. J. O. YEASTING, vice president-controller, is appointed vice president, finance; and PAUL FORD becomes Seattle division controller. Changes follow decease of HAROLD E. BOWMAN, formerly secretary-treasurer.

ASSOCIATIONS ELECT

American Society for Quality Control, Seattle section: Chairman, GRANT I. BUTTERBAUGH, associate professor of accounting, finance and statistics, *University of Washington;* vice chairman, KENNETH L. ARMOUR; secretary, WILLIAM A. BENNETT; treasurer, NORMAN W. STEELE, JR.

Personnel Management Association of San Diego: President, V. L. SUMMITT, *Convair;* vice presidents, ROBERT PUTNAM of *Rohr Aircraft Corp.* and T. S. THOMPSON of *Security Title Insurance Co.;* secretary, LUCILE ZWECK, San Diego city schools; treasurer, ARTHUR ANDERSON, *San Diego Trust & Savings Bank;* and sergeant-at-arms, JOSEPH GRAHAM, U. S. Naval Station.

Purchasing Agents' Association of Oregon: President, WINSTON S. BUNNELL; first vice president, HAROLD E. BLOYD; second vice president, RUSSELL WETHERELL; secretary, ARLOW J. WEBB; treasurer, MAYNARD S. MIKSCH; trustees, L. C. BARNES, LEONARD CLARK and MERITT L. SIMMONS.

Society of Industrial Packaging and Material Handling Engineers, Northern California chapter: Chairman, H. J. SIMMONS, *Hall-Scott Motors;* vice chairman, H. J. O'BRIEN, *National Container Corp.;* secretary, H. R. KATTLEMANN, *Container Laboratories, Inc.*

Federated Employers of San Francisco (formerly San Francisco Employers Council): President: ALEXANDER R. HERON, *Crown Zellerbach Corp.*

American Society of Mechanical Engineers: Regional vice president, Region VII, VERNON A. PETERSON, district manager, *Elliott Co.,* Los Angeles.

Gas Appliance Manufacturers Association: First vice president, T. T. ARDEN, *Robertshaw Fulton.*

Concrete Products Association of Washington: President, B. E. HARRISON, president, *Harrison Pipe Co.,* Tacoma; vice president, GEORGE F. RUTH, assistant vice president, *Long-Bell Lumber Co.,* Longview; secretary, E. ELLIS CUMMINS, *Yakima Cement Products Co.,* Yakima; treasurer, VERNE FRESE, *Layrite Concrete Products of Seattle, Inc.*

National Association of Metal Finishers, Inc.: Third vice president, ALBERT W. OLSON, *Industrial Plating Works, Inc.,* Seattle.

National Defense Transportation Association, Utah chapter: President, R. O. BURKHARDT, *Illinois Central Railroad,* Salt Lake City; first vice president, C. ROY NICKERSON, *Utah General Depot,* Ogden; second vice president, HAROLD DAVIS, *Carbon Motorways;* secretary-treasurer, A. D. TERRELL, *Whitfield Transportation Co.*

Los Angeles Advertising Women, Inc.: President, MRS. CHARLOTTE S. DE ARMOND, public relations director of *Pacific Airmotive Corp.,* Burbank; first vice president, MARGARET H. FINFROCK, executive secretary-treasurer, *Miracle Mile Assn.;* second vice president, JACQUELINE BRITTON, publicity director, *Smalley Levitt & Smith, Inc.;* treasurer, GERALDINE PARKER KNIGHT, research director, *Verified Audit Circulations;* assistant treasurer, MIMI K. PHILLIPS, free-lance editor; recording secretary, CHERRY BOATMAN, circulation promotion assistant, *Hollywood Citizen-News;* and corresponding secretary, DORIS JACKSON, editor of "Mail Box Shopper," *Westways Magazine.*

Technical Association of Pulp and Paper Institute, Pacific section: Chairman, F. R. WELEBER, *Publishers Paper Co.;* vice chairman, ED NUNN, *Crown Zellerbach Corp.,* West Linn, Ore.; secretary-treasurer, H. B. PETERSEN, *Hercules Powder Co.,* Portland.

American Council of Commercial Laboratories, Western division: Chairman, DR. DAVID B. CHARLTON, *Charlton Laboratories,* Portland; vice-chairman, CLAUDE E. MCLEAN, *Arizona Testing Laboratories,* Phoenix; secretary-treasurer, FRANCIS OWENS, *Laucks Testing Laboratories, Inc.,* Seattle.

American Rocket Society, Southern California section: President, SAM HOFFMAN, *North American Aviation, Inc.;* vice president, DR. H. S. SEIFERT, *Cal Tech.;* secretary-treasurer, R. D. GECHLER, *Aerojet.*

Idaho Mining Association: President, R. D. LEISK, *Sunshine Mining Co.;* vice president, L. E. TROEGER, *Anaconda Copper Co.*

Association of Official Racing Chemists: President, DR. ROGER W. TRUESDAIL of *Truesdail Laboratories, Inc.,* Los Angeles.

DOES YOUR PRODUCT INCLUDE PARTS OF BRASS OR BRONZE?

We are specialists in the manufacture of brass and bronze items—including:

Complete assemblies
Castings
Machined parts

From the drawing to the finished part.

Inquiries invited.

Contract Division
CALIFORNIA BRASS MFG. CO.
1447 Naud Street
LOS ANGELES 12, CALIF.
Telephone Ca 8114
Established year 1918

Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

King-Knight adds Katolight

King-Knight Co., San Francisco, is appointed exclusive factory representative for Katolight Corp. in California, Nevada and Hawaiian Islands. Katolight sales and engineering at King-Knight will be under direction of H. F. Neuman, sales manager, and will be handled in field by B. C. Ashoff. Equipment available includes air- and water-cooled light and power plants, from 500 watt to 40 kw., generators, rotary converters and motor-generator sets manufactured by Katolight Corp., a division of Kato Engineering Co., Mankato, Minn. New line supplements extensive equipment sales and service offered by King-Knight, including Buda, Nordberg, Sterling, Skinner, Murray, Coppus and other lines, as well as company-designed and manufactured engine-generator sets, automatic stop-start controls and fire-pump controls.

Flexaust representatives

The Flexaust Co., New York, formerly American Ventilating Hose Co., appoints three new West Coast agents: Charles Vermilye Co. in Los Angeles and Samson Sales Co. in San Francisco for Southern and Northern California, and R. E. Chase Co., Tacoma, for Washington and Oregon.

In charge of all chain saw sales

Willard L. Rusch is appointed sales manager, chain saws, of McCulloch Motors Corp., Los Angeles. Rusch, formerly assistant sales manager, has also managed traffic and order departments at McCulloch, where he has been employed for nearly 15 years. Allan A. Harris, sales engineer, becomes assistant sales manager, chain saws.

W. L. Rusch of McCulloch Motors

M. Holm of Fruehauf Trailer Co.

New division sales manager

Marvin Holm is named sales manager for Northwest division of Fruehauf Trailer Co. Holm joined Fruehauf in 1950 as sales representative in Sacramento and for past two years has served as branch manager in Spokane. He has been in trailer business for about 15 years.

Correction

Miniature Precision Bearings, Inc., has not closed its West Coast office, as reported in the August issue of *Western Industry*. Edward D. Maltby Co. continues to represent the company in Southern California, Arizona and Hawaii, with offices in Los Angeles, San Diego, Phoenix and Honolulu. Albert Schweitzer, deceased, who had been the representative in Northern California and Nevada, was an independent operator, and for the present sales and engineering service will be provided from the Keene, N. H., plant. Later in the year Miniature Precision Bearings will open a West Coast office and branch plant.

Appoint Fryer

Herbert E. Fryer, Denver, is selected as special representative by Townsend Co., fastener manufacturer with headquarters in New Brighton, Pa. Fryer retired recently from post of Denver sales manager for U. S. Steel Corp.

Changes at American Air Filter

Pacific regional office, San Francisco branch office and Pacific warehouse of American Air Filter Co., Inc., are consolidated at

We Spend HOURS
THINKING ABOUT WIRE...

INDUSTRIAL Wire PRODUCTS
CORPORATION
5649 ALHAMBRA AVE. • CA 27131
LOS ANGELES 32, CALIFORNIA
431 WESTWOOD DR. • PL 5-3463
SAN ANTONIO 12, TEXAS
4868 PINE ST. • HO 9-3753
LA MESA, CALIFORNIA

for longer tool life...

Electrolize!

Operational results prove that Electrolized taps, chasers, drills, reamers, mills, hobs and other usually short-lived tools last 3 to 10 times longer. Electrolized tools are freer-cutting; practically eliminate "build-up", produce finer finishes; permit higher feeds and speeds; are corrosion protected. They can be resharpened more often and be Electrolized anew. We will Electrolize your sharpened tools for a nominal cost. (Also, wear-life of your production parts is increased by Electrolizing.) Phone or write to

ELECTROLIZING SALES and TOOLS, Inc.
1406 E. 15th St., Los Angeles 21, Calif. • PR 7876

Your Water Treatment Problem

and how to handle it

A booklet covering the essentials of water analysis, filtration, softening, scale removal, cost reduction by recirculation, cooling tower efficiency.

Plus

a tabulation of water analyses for hundreds of cities in the eleven Western States.

This is a reprint of a series of articles which appeared in *Western Industry* in 1950-1951. The tabulation of water analyses is the only thing of its kind available anywhere.

Single copies . . 50¢ each*
25 copies up . .. 30¢ each*
50 copies up . .. 20¢ each*

***When ordering in California, add 3% Calif. sales tax.**

Available from

WESTERN INDUSTRY

Use This Coupon

WESTERN INDUSTRY
609 Mission Street
San Francisco 5, Calif.

Please send me ..... copies of your water booklet. Check for $..... (including Calif. sales tax enclosed.

Name.....

Address.....

.....

new location, 460 Ninth St., San Francisco. C. A. Pickett, former Pacific regional manager, transfers to Chicago and is succeeded by Richard H. Nelson, vice president of company. W. B. Polhemus continues as manager of San Francisco branch office.

Advancement for Mullin

James B. Mullin assumes post of manager, asphalt sales, for marketing department of General Petroleum Corp., at its Vernon offices. Mullin has been with General Petroleum since 1946 as an asphalt engineer, and was previously employed by an affiliated company, following his graduation from University of Calif. at Berkeley in 1930.

Heads new department

Tudor A. Wall becomes manager of newly created Department of Industrial Development, Kaiser Steel Corp., with offices in Kaiser Building, Oakland. He has been with Kaiser Steel in the sales department since 1948.

New offices—in triplicate

Lincoln Engineering Co. opens modern sales and service headquarters at three West Coast locations—Portland, Berkeley and Los Angeles. New buildings are specially designed to provide room for display, sales and service departments, receiving and shipping and for future expansion.

Ryerson machinery representative

Warren T. Ross becomes sales representative of Machinery and Tool division of Joseph T. Ryerson & Son, Inc., and will cover state of California for Ryerson's Los Angeles and San Francisco plants. Ross joined company's sales department at Los Angeles in 1949 and later held post of supervisor of activities in general steel and specialty product sales divisions. As field representative, he will sell shop equipment for bending, braking, drilling, forming, grinding, hoisting, pressing, punching, rolling, sawing, shearing and threading.

Tuffli in new position

Tell D. Tuffli is appointed assistant district manager of U. S. Steel Supply division, U. S. Steel Corp., Los Angeles. He succeeds William J. Borwick, now district manager in Portland, Ore. Tuffli has been with company since 1948 as salesman in Los Angeles warehouse.

T. D. Tuffli of U. S. Steel

J. L. Arthur of Calstrip Corp.

Sales manager for Calstrip

Calstrip Corp., Los Angeles, manufacturer of cold rolled strip steel, names James L. Arthur to position of sales manager. He has been with Calstrip sales department since 1945 and prior to World War II had other steel mill experience.

Sales manager—aircraft operations

J. D. Strickland is appointed sales manager of Pacific Airmotive Corp.'s aircraft and engine divisions at both Burbank and Chino, Calif., plants. Formerly commercial sales manager for Grand Central Aircraft Co., Glendale, Strickland has had over 15 years of aircraft sales and service experience.

Sheldon appointed as v. p.

Harold H. Sheldon becomes vice president, sales division, of Holt Manufacturing Co., Oakland, maker of floor maintenance and finishing machines. Before joining Holt, Sheldon was with Pittsburgh Plate Glass on

IS OUR BUSINESS

AND WE KNOW THE WIRE BUSINESS

For — Music Wire • Stainless Wire • Oil Tempered Wire • Phosphor Bronze Wire — In Round • Square • Flat or Special Shapes . . . Call Us

We Can Supply You From Our Warehouse or Give Prompt Mill Shipment

KRUSEN WIRE & STEEL CO.

4312 Pacific Way, L. A. 23, AN 1-2147

MILLER-ROBINSON CO.

HIGH FREQUENCY INDUCTION PROCESSING

SILVER BRAZING

LOCALIZED HEAT TREATING

Production — Tooling
Engineering — Equipment

7007 Avalon Blvd., Los Angeles 3
PLeasant 2-6141

West Coast for 25 years and is widely acquainted in painting, hardware and maintenance trade.

New addition to sales by Lockheed

C. C. Sansom, Los Angeles, is assigned to sales department of Lockheed Aircraft Service, Inc. He was previously in corporation's engineering department in charge of special devices, engineering group. In his new position, he will be a service sales engineer, assisting sales department in sales development of training devices which include special electronic training panels.

Chemical Service changes

John B. Merritt, executive vice president of BJ Service, Inc., and of Industrial Chemical Service Co., announces opening of an Industrial Chemical Service station at Portland, Ore. Keith J. Swift, fieldman, transfers from Oakland, Calif. station to Portland in order to take charge of it. W. H. Atkins, sales engineer, is transferred from Oakland station to Long Beach, Calif., where he replaces R. L. Johnston who was recently reassigned to Glendive, Montana, station, Rocky Mountain division of BJ Service, Inc. A. M. Marzolla, a former employee now again with this company, replaces Atkins at Oakland. The Industrial Chemical Service Co. is a wholly owned subsidiary of BJ Service, Inc.

Digitizer distribution

Beckman Instrument Co. of Richmond, Calif., is named Northern California distributor by Coleman Engineering Co., Los Angeles, of its "digitizer." Device is an electro-mechanical shaft position indicator employed in readout systems where data are presented for visual reference. Beckman is said to be world's largest distributor of scientific instruments.

New tape division

Pee-Tee tape, a moisture activated, gummed Kraft sealing tape, now has a division of its own at Printed Cellophane Tape Co., Los Angeles. Heading this division will be E. G. Westlund, formerly with Neil Sinclair, Inc. Printed Cellophane Tape Co. is owned and operated by a father-and-son team, Don and Sydney Gevirtz.

Valve distributors named

E. D. Sweetland Co., San Francisco; Pace-Turpin & Co., Salt Lake City; and Palmer Supply Co., Seattle, are appointed distributors by Republic Manufacturing Co. of Cleveland. Republic manufactures small hydraulic and pneumatic valves for general, aircraft, chemical, and process industries, in all metals and types of connections, in sizes up to one inch.

Hydreco distributor

The Rucker Co. is appointed exclusive distributor for Hydreco products in California, Oregon, Washington, Idaho, Nevada and Arizona. Sales, service and engineering on Hydreco line of oil-hydraulic gear pumps, fluid motors, control valves and cylinder assemblies will be available from Rucker offices in Oakland, South Gate, Calif., and Seattle.

Pipe distributor names manager

Allied Supply Co. of California, distributor of pipe, valves, fittings and engineering specialties in Southern California, appoints P. Sweeney as office and warehouse manager. Associated with Allied Supply for ten years, he has, for last eight of them, been warehouse superintendent.

We can take care of all your forging needs— big or little...
CALL US NOW!

It pays to buy...
***AMERICAN FORGINGS**

***AMERICAN FORGE CO.**
Executive offices and plant: Niles, California
Phone Niles 3311
Sales offices:
101 Park Ave., New York City
Portland, Oregon
Los Angeles, California
Salt Lake City, Utah

7

Because You Get...

HIGH QUALITY
press forgings, open hammer forgings, drop forgings, upset forgings, grinding media—all made by West's largest and most complete forging plant ... all produced to most exacting tolerances.

ONLY CERTIFIED STEELS
are used in the manufacture of our forgings. All forgings are heat treated under supervision of metallurgists. Complete physical and chemical reports supplied with all major components.

FREE CONSULTING SERVICE AND METALLURGICAL LABORATORY
to study, test and make sure you get the right type of forging, steel and grain structure for your job.

BLUE DIAMOND
INDUSTRIAL
RUBBER LINING

Pipe • Fittings • Valves
Tanks • Drums • Tumblers
Fans • Blowers • Ducts

Here's the economical way to make metal resistant to chemicals, abrasive materials, or contamination... Blue Diamond linings have proven themselves in hundreds of installations under severest conditions. Rubber lining assures longer life and lower maintenance costs for tanks, pipes, fittings, tumblers, blower housings, ducts, etc. Blue Diamond Rubber is a vulcanized product the components of which are crude rubber and other materials ... cured by vulcanization at controlled temperatures. Linings are available in a range of hardnesses to meet your specific application. *Prices are right!*

Phone or Write for Literature and Complete Details

BLUE DIAMOND RUBBER LINING

LATEX DIPPED PRODUCTS

4520 East Washington Blvd • Los Angeles 22, California • Telephone ANgelus 3-1437

BOOKS FOR INDUSTRY

SUCCESS THROUGH welding for the small business

This booklet of 50 pages relates the success stories of 25 men who have achieved their positions because of opportunities presented by the arc welding process. Although all 25 stories have this feature in common, the book's intent is to point out that there is still opportunity in the American tradition of free enterprise for success through perseverance, ability, hard work and individual initiative.

Articles are reprinted from The Lincoln Electric Company's magazine for arc welders, "The Stabilizer." Price is 75 cents a copy from the publisher, *The Lincoln Electric Co.*, Cleveland 17, Ohio.

"WASHING OUR WATER: your job and mine"

Pamphlet with this title, No. 193 in a series published by *The Public Affairs Committee, Inc.*, introduces the layman to the problem of water pollution and the water cycle. Author is Helen Beal Woodward. Its purpose is to arouse public concern over the need for purifying sources of water supply "while there is still time." It sets out to show that something new is happening to our water, that the growth of cities and industries, particularly the chemical industry, is putting a strain on our water supply system that it has never known before. The solution is not to "learn how to live with pollution" by treating water before it is used, but to prevent original stream contamination by seeing that every city and every industry reduces or treats its wastes.

The case history of Florence, Alabama, is cited to show how a city can solve its local waste problem. And a number of ingenious waste utilization schemes worked out by particular industries are given, to suggest that cleaning up pollution may pay off in cash.

Single copies of pamphlet No. 193 are 25¢, with special quantity rates as low as 10¢ on large orders. *Public Affairs Pamphlets*, 22 East 38th Street, New York 16, N. Y.

"WATER QUALITY CRITERIA" compiled by State of California

This report was made for the Water Pollution Control Board of the State of California by the California Institute of Technology for use as a guide in determining whether water pollution exists in cases before the control boards.

Data are presented in four sections:

1. Compilation of standards on water quality used by state and interstate control agencies in the United States.
2. Review of what the courts have had to say on water quality criteria.
3. Standards of quality for major beneficial uses, such as drinking water, industrial water, irrigation, and others.
4. Alphabetical listing of all potential pollutants on which data are available, from "abietic acid" to "zinc sulfate." This section occupies 243 of the total 512 pages in the book.

"Water Quality Criteria," SWPCB Publication No. 3, is available for $3, not including sales tax, from Documents Section, State Printing division, 11th and "O" Sts., Sacramento 14, Calif. Payment should accompany orders.

RADIOACTIVE WASTE removal with conventional sewage system

This report, "Radioactive Waste Removal in a Trickling Filter Sewage Plant," by A. L. Biladeau, Sanitary Engineer at the Idaho Operations Office of the Atomic Energy Commission, describes the first plant of its kind to use conventional biological methods of domestic sewage treatment for removal of radioactivity from waste liquids.

The plant is a conventional trickling filter sewage system at the National Reactor Testing Station, which was modified to handle simultaneously both domestic sewage and radioactive laundry wastes. (Purification of liquids in a trickling filter, unlike a sieving filter process, is brought about by micro-organisms present in the coarse grain bed, through processes of absorption, biological precipitation, fermenting and other actions in the growth of the organisms.)

Operations of the combined treatment plant will be supervised closely, with special operating records to show percentage removal of radioactivity. This simple and cheap method, if successful, will be important to industry, hospitals, research laboratories and governmental agencies using radioactive materials.

Report may be purchased from Office of Technical Services, Department of Commerce, Washington 25, D. C.

IF YOU HAVE A GRINDING OR SCREENING PROBLEM

"CALL FERNHOLTZ FIRST" FOR COMPLETE INFORMATION ON

COMBS GREAT WESTERN SCREENING MACHINES for screening starch, sugar, mica, flour, sand, enamel and glaze.

BUFFALO HAMMER MILLS for high capacity industrial grinding.

BELL HAMMER MILLS for specialty grinding applications.

OVERSTROM SCREENING MACHINES for orange juice, tomatoes, rock, gravel, palm oil, fish bones and peppers.

FITZ COMMINUTING MACHINES for grinding frozen cream and eggs, sugar, tomatoes, chemicals, plastics, cosmetics, and ceramics. No dust collector—low temperatures maintained.

FERNHOLTZ MACHINERY CO.

8468-W MELROSE PLACE
LOS ANGELES 46, CALIF. • WEbster 8-5145

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are ⅛ inch short of contracted space to allow for borders and composition. Rates are $7.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

NEW PRODUCT

PHOTOCOPIES
in 1 MINUTE at your desk—on the
DUPLOMAT-ULTRA
low priced—all electric, fully automatic Photocopying Machine. Exposing, developing and transferring in ONE UNIT. Photolike duplicates up to 14½" width, any length.
THE DUPLOMAT COMPANY
126 Post Street YU 6-5941 San Francisco, Calif.

POSITION AVAILABLE

SALES ENGINEERS

Experienced (Age 28-40) selling heating, ventilating, air filter or closely related products to engineers, architects, industrials, wanted by nationally known manufacturer for its offices in San Francisco and Los Angeles.

★

Correspondence to Vice President, 460 Ninth Street, San Francisco 3, Calif., will be answered in confidence.

ANODIZING FACILITIES

Full finishing service for aluminum products. Clear Anodize; R-5 Bright Dip; Color Anodizing; Government Specifications; Frankford Arsenal Spec. No. FXS-963 Type B Class 1, 2, & 3.

ALSO DICHOMATE SEALING:

Prompt Service from
W. F. HEINE SUPPLY CO.
6015 Adeline St. Oakland 8, Calif.
OLympic 3-5500

PLATE ROLLS

Complete with 2 top rolls, 16" in. diam. and 10½" diam. Can roll ¾" plate, 16' long to 24" diam. 50-hp. motor included. Mr. Hall
PACIFIC COAST ENGINEERING CO.
LA 2-6100 Alameda, Calif.

WELDESIGNED for the designing engineer

Content of courses given by The Lincoln Electric Co. on designing machinery from welded steel makes up this text, never before published, on "WelDesign." It is arranged for self-study and is accompanied by a book of weld standards, notes for self study, a copy of the "Procedure Handbook of Arc Welding Design and Practice," a Lincoln WelDesign cost calculator and a Lincoln "I" rule. Self-study material is available from *The Lincoln Electric Co.*, Cleveland 17, Ohio, for $10.

POSITION WANTED

TRAFFIC MAN

available as traffic manager or assistant or in other work in which knowledge of rate structure, traffic movement, transportation operations and executive level traffic management is important.

Rail, forwarder and shipper experience as chief rate clerk, yardmaster, warehouse manager, rate and classification analyst; member freight classification committee; 6 years section chief, Interstate Commerce Commission.

Knows rates, transit, claims, rate negotiation. Qualified office manager. Some knowledge bookkeeping, accounting, taxes.

WRITE OR WIRE: BOX 901
WESTERN INDUSTRY
609 Mission Street, San Francisco 5, Calif.

INDUSTRIAL ENGINEER . . . 13 yrs. experience as supervisor in methods, incentives, evaluations, systems and procedures, etc. Age 36. Degrees in Engineering and Business. Desire position as Consultant, Sales or Staff Assistant to progressive Industrial Executive.

Please Write: BOX 902, WESTERN INDUSTRY
609 Mission Street, San Francisco 5, California

READ & USE
WESTERN INDUSTRY
CLASSIFIED ADS

100 GENUINE 8 x 10 PHOTOS 10¢ ea
24 HOUR SERVICE!
FREE DELIVERY ANYWHERE
MADE DIRECT FROM PHOTOS OR NEGATIVES • 50 8 x 10 13¢ ea • 500 8 x 10 8¢ ea
1000 8 x 10 GLOSSIES 7¢ EACH
POSTCARDS
5000 $21 PER M 2½¢ EA
SAVE THROUGH QUANTITY PRODUCTION
FOR COMPLETE PRICE INFORMATION WRITE OR PHONE
QUANTITY PHOTOS, Inc.
Hollywood 7-6179
5509 SUNSET BLVD. HOLLYWOOD 28 CALIF.
LARGEST PHOTO REPRODUCTION PLANT IN WEST

Pipe Repair CLAMPS

Made for every type of leak—any temperature or pressure. Send for Catalog No. 41-O.
M. B. SKINNER CO., SOUTH BEND 21, INDIANA

Want Ad Order Blank

Please run my ad 12, 6, 1 time (circle which) at the rate of $7.50 a column inch. Make ad 1, 2, 3 columns wide (circle which) by ..... inches (specify, one to 10) deep.

Signed .....

Address .....

City..... State.....

WRITE AD HERE:

.....

.....

.....

.....

.....

.....

.....

.....

Send ad to Classified Dept.,
WESTERN INDUSTRY, 609 Mission St., San Francisco 5, Calif.

INDEX TO ADVERTISERS IN THIS ISSUE

A

Advance Gear & Machine Corp. 56
Aeroquip Corporation 45
American Appraisal Company, The 108
American Forge Co. 113
Atlas Chain & Manufacturing Co. 61

B

Bethlehem Pacific Coast Steel Corporation .. 47
Brainard Steel Company 82
Brookes, E. Jordan, Co., Inc. 81
Buda Company, The 15
Bullard, E. D., Company 50

C

California Bank, Los Angeles 24
California Barrel Company, Ltd. ..... Cover 2
California Brass Mfg. Co. 110
Calstrip Steel Corporation 80
C. B. S. Steel & Forge 101
Chase Brass & Copper, Sub. Kennecott Copper Corporation 67
Clark Equipment Company 58
Cold Metal Products of California, The ..... Cover 3
Coldwell, Banker & Company 118
Columbia-Geneva Steel Division, United States Steel Corporation .. 12, 87 & 95
Connor Spring Manufacturing Co. 104
Cooper Alloy Foundry Co. 13
Crane Co. 10

D

Delta Power Tool Division, Rockwell Manufacturing Company .. 16 & 17
Denver Fire Clay Company, The 122
DoAll Company, The 55
du Pont de Nemours, E. I., & Co., Inc. 25

E

Edwards, E. H., Company 109
Electrolift, Inc. 98
Electrolizing Sales & Tools, Inc. 111
Evis Manufacturing Co. 84

F

Faultless Caster Corporation 89
Fernholtz Machinery Co. 114
Flexible Steel Lacing Company 101
Flexivise Co. 100
Food Machinery & Chemical Corporation, John Bean Division 70
Foster, L. B., Co. 78

G

Galland-Henning Mfg. Co. 99
Garfield Chemical & Manufacturing Corporation 106
Garrett Supply Co., Division of Garrett Corp. 74
General Appraisal Company 110
General Electric Co. 18
General Petroleum Corporation 9
Goodall Rubber Co. 68
Goodrich, B. F., Co., The 3
Grinnell Company 79

H

Harnischfeger Corporation 48
Haynes Stellite Company, Division Union Carbide & Carbon Corporation 59
Holz Tire & Rubber Co. 94

I

Industrial Wire Products Corporation 111

J

Johnston, A. P., Co. 116
Jorgensen, Earle M., Co. 72

K

Kaiser Steel Corporation 119
King Publications 112
Krusen Wire & Steel Co. 112

L

Latex Dipped Products 113
Lewis-Shepard Products, Inc. 85
Lincoln Engineering Co. of California 57
Linde Air Products Company, Division Union Carbide & Carbon Corporation .. 8 & 19
Lovejoy Flexible Coupling Co. 106

M

McDonough Steel Co. 97
Magline Inc. 96
Mall Tool Company 88
Masonite Corporation 7
Master Electric Company, The 75
Master Fan Corp. 76
Meriam Instrument Co., The 104
Miller-Robinson Company 112
Miniature Precision Bearings, Inc. 23
Modern Manufacturing Co. 102
Modernair Corporation 120
Moto-Truc Co., The 71

N

National Supply Company, The 52
National Welding Equipment Co. 14
Norgren, C. A., Co. 66

O

Oakite Products, Inc. 120
Osborn Manufacturing Company, The 6

P

Pacific Scientific Co. 5
Pacific Telephone and Telegraph Company 103
Perin, Ira G., Co. 107
Petley Incorporated 100
Plexolite Sales Co. 22
Powers Regulator Company 102

R

Rangers Die Casting Co. 98
Reliance Steel Co. 83
Republic Supply Company of California 27
Revere Copper and Brass Incorporated ..... 42 & 43
Richfield Oil Corp. 26
Ridge Tool Company 86
Ryerson, Joseph T., & Son, Inc. 28

S

Screw Conveyor Corp. 105
Skil Corporation 69
Smoot-Holman Company 11
Snap-On Tools Corporation 46
Soulé Steel Co. 121
Standard Conveyor Co. 108
Standard Oil Company of California 77
Stephen-Adamson Mfg. Co. ..... Cover 4
Surety Rubber Co., The 96

T

Thermoid Western Co. 21
Tri-State Supply Corporation 109

U

Union Pacific Railroad 123
United States Steel Corporation ..... 12, 51, 87 & 95
United States Steel Supply Division, United States Steel Corporation 51

V

Victor Equipment Co. 105

W

Watson-Stillman Fittings Division, H. K. Porter Company, Inc. 65

Y

Yuba Manufacturing Co. 90

Z

Zurbach Steel Co. of Calif., Inc. 110

Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

A. P. JOHNSTON CO.
1845 E. 57th St., Los Angeles

THE West ON ITS WAY

NEW PLANTS, EXPANSIONS, NEW INDUSTRIES, PRODUCTION CONTRACTS,

DEVELOPMENT PROJECTS, UTILIZATION OF RESOURCES

PACIFIC COAST LEADS NATION IN RATE OF GROWTH

COMPARATIVE rates of growth from 1947 to 1951 between the Pacific Coast and the United States as a whole, expressed in terms of percentages, show that the Pacific Coast outpaced the nation in the expansion of most industries, according to the Federal Reserve Bank.

"The growing importance of most Pacific Coast industries in national output" says the *Monthly Review* of the Federal Reserve Bank of San Francisco, "is apparent from the rise in their share of the value added [Editor's note: "Value added" is the term used by the Census Bureau to indicate value of shipments less cost of materials, etc.] for the United States.

"It is also interesting to note the dispersion of the percentages for 1951. Five Pacific Coast industries contributed more than 10% of the national value added in their respective lines.

"Except for these five industries, the Pacific Coast tends to contribute a moderate, and in a few cases a minor, proportion of national production. This reflects the historically earlier and more intense development of manufacturing in some other parts of the nation. It also points up the specialization of the Pacific Coast in those industries in which it has a resource or location advantage.

"Nevertheless, many of the Pacific Coast industries which account for small shares of United States output have grown more rapidly than have the same lines nationally. As population in the West continues to grow more rapidly than in the nation, as land in other areas becomes scarcer, and as rising transportation costs make the dispersion of manufacturing more profitable, the Pacific Coast shares of industrial output in many lines will continue to rise."

* * *

Business and employment in California will continue substantially ahead of a year ago for the balance of 1953, according to a California Manufacturers Assn. poll. At the same time, a slowing down in rate of gain is reported.

Thirty-one per cent of the manufacturers polled expect to book a larger volume of business in the fourth quarter than in the like period last year. Three months earlier 33% expected a larger volume; six months ago 43%; nine months ago 44%.

In actual dollar volume of billings, 31% expect their fourth quarter sales to exceed the same period last year, 39% expect they will be about the same, and 24% less.

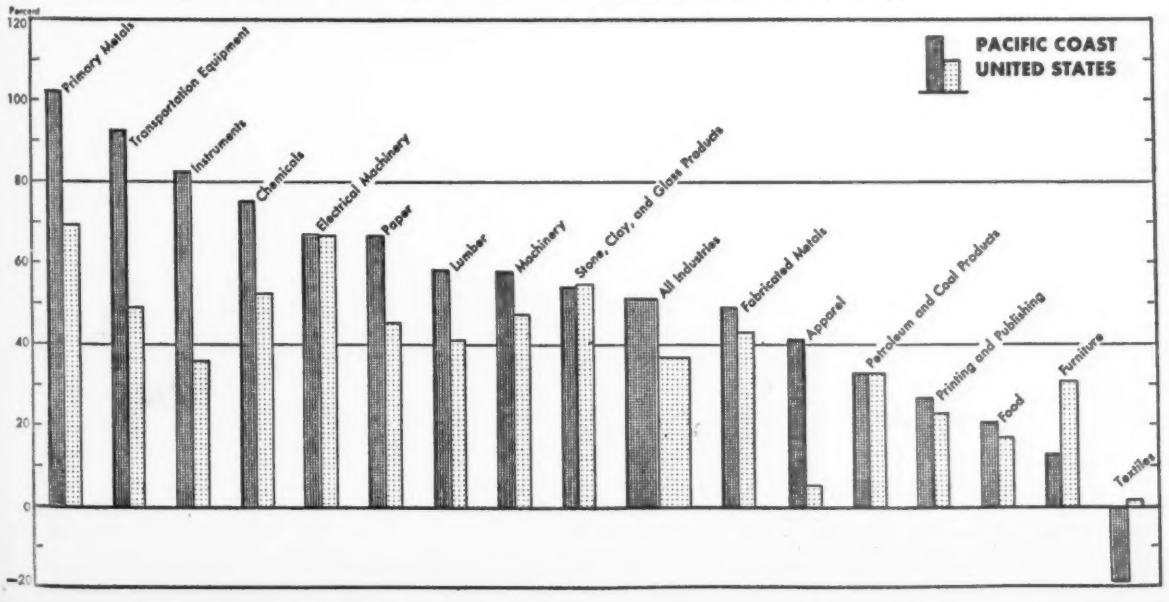
Figures on average number of employees for the fourth quarter of 1953 as compared with 1952 are: more, 26%; less, 22%; about the same, 52%.

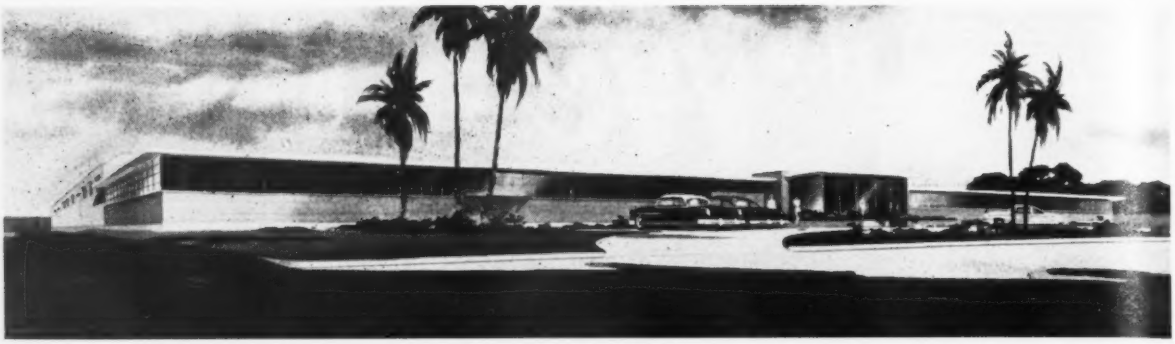
Inventory of finished products (in dollar value): up, 34%; down, 22%; about the same, 44%.

Inventory last three months: increased, 26%; reduced, 22%; relatively unchanged, 52%.

COMPARATIVE MANUFACTURING INCREASE, 1947-1951, IN PERCENTAGES

Federal Reserve Bank chart of value added, by major industry groups





TV PLANT—Architect's sketch of plant under construction for Pacific Mercury Television Mfg. Corp., Van Nuys, Calif. Building, to be completed by end of year, will have 122,000 sq. ft. area and is reported to be start of a $1,000,000 building program.

ALASKA

PULP AND PAPER MILL—Georgia Pacific Plywood Co., New York and Olympia, will build pulp and paper mill at Juneau. Facility planned will cost over $55,000,000 and have annual production of 96,000 tons. Company may also build smaller mill at Wrangell.

CALIFORNIA

AIRCRAFT SUBCONTRACTS—Al-Fin division of National Steel and Shipbuilding Co., San Diego, receives contract in higher five figures for undisclosed number of controlled surfaces for guided missiles from Pomona division of Convair. National Steel is also supplying structural steel for hangars at Biggs Air Force Base, Planeport, Tex., and Kirtland Air Force Base, Albuquerque, N. M., totaling 800 tons, and is completing delivery of 1,800 tons to Lockheed's experimental station at Palmdale, Calif.

PLATINUM PROCESS—Shell Oil Co. plans to construct $1,700,000 platforming unit at its Martinez refinery for boosting low-octane gasoline. C. F. Braun and Co. will build facility. Catalytic reforming process using platinum as catalyst will treat 4,500 bbl. of gas daily when plant is completed next July. This is first Shell refinery in West to use this process, developed by Universal Oil Products of Chicago.

CYCLEWELD ADHESIVES — West Coast adhesives plant is opened by Cycleweld Cement Products division of Chrysler Corp., housed in Chrysler's Los Angeles assembly plant. Products are industrial high-strength structural adhesives and pressure-sensitive adhesives for aircraft, furniture, automotive, textile and other industries. West Coast divisional manager is L. M. Wolf.

BAKERSFIELD PLANT—Mongerson's Electrical Machine Works, Los Angeles, established in 1912 and recently incorporated, plans expansion of Bakersfield plant. Firm, which also has plants at South Gate and Burbank, manufactures electrical safety switches and pumping plant switchboards, and is undertaking development of new products in related fields.

VENDING MACHINE PLANT—Newly organized King Manufacturing Co., San Diego, buys factory in Gardena, near Los Angeles, for manufacture of multiple hot drink vending machine. Machine, which is first ever designed to dispense eight different hot drinks, uses powdered mixtures. President of new company is David Moon.

CHANGE OF STATUS — Sunnyvale plant of Westinghouse Electric Corp. becomes independent operating unit of company, under new manager George F. Gayer. Remaining Westinghouse plants in West, at Huntington Park and Emeryville, Calif., Portland, Seattle and Salt Lake City, continue under Manufacturing and Repair division, headed by Leonard N. Goodell, newly appointed Pacific Coast district manager. Westinghouse acquired Sunnyvale plant, now known as its Pacific Coast manufacturing plant, from Joshua Hendy Iron Works in 1947 and operation now employs about 3,200 persons.It has recently received a $200,000 order from Pacific Gas and Electric Co. for two 13-ft.-diameter butterfly valves, to be installed at Pit River No. 4 plant now under construction north of Redding.Valves are scheduled for delivery in summer of 1954.

OVERHAUL C-54'S—Pacific Airmotive Corp., Burbank, receives Air Force contract totaling over $5,000,000 for modification and overhaul of C-54's at its Chino plant. Contract is fourth since September 1950 to be awarded PAC at Chino, now the only private maintenance company reconditioning C-54's for Air Force. Company will continue to overhaul commercial aircraft and is currently working on DC-4's. Construction is under way at Chino on nose-type hangar to accommodate planes as large as Super Constellation and DC-7.

NEW WAYS FOR MARWAIS—Marwais Steel Co. opens new plant in central manufacturing district of Los Angeles. Designed by Architect Herman Light, plant, about 30,000 sq. ft. in area, has capacity of over 5,000 tons of flat rolled steel per month, on a production-line system which uses two 10-ton overhead traveling cranes.

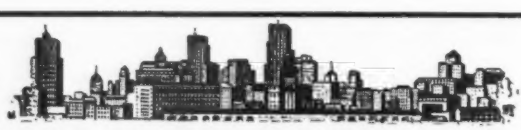
TO ASSIST CONTRACTORS — New firm, H. N. Bailey and Associates, is organized in Los Angeles, to represent aircraft component manufacturers in their negotiations with military offices in Washington and elsewhere. Founder of firm is Colonel Harry Bailey, who recently resigned as vice president of Rosan Engineering. During World War II Bailey was officer in charge of Boeing Renton plant and production engineering officer with Air Materiel Command.

EXPANSION—Streeter Manufacturing Corp., manufacturer of Luminite reflective sheeting, moves to new factory at 17269 Vanowen St., Van Nuys. In addition to increased production facilities, plant provides for experimental laboratory, to be completed by November. Firm will add new product, light reflective insignia for trucks and billboards.

HAND MADE—Hand Container Corp. is organized in Los Angeles by Dalt Hand, Pat Gedda, Del Sturm, C. M. Davis and Dave Harris. Firm will manufacture corrugated shipping containers.

FREIGHT LINE PURCHASE—Subject to Interstate Commerce Commission approval, Pacific Intermountain Express, Oakland, will purchase all corporate stock of West Coast Fast Freight, Inc., Los Angeles, and certain of its affiliates, including System Tank Lines, Inc. Payment will be partly in cash and partly in P-I-E common stock. Combined gross

INDUSTRIAL PROPERTIES
Warehouses - Buildings - Lofts - Plants - Factory Sites — Appraisals



SALES • LEASES
COMPLETE COVERAGE
Up-to-the-Minute Lists

COLDWELL, BANKER & COMPANY **REALTORS**

57 Sutter Street, SAN FRANCISCO 4, Phone SUtter 1-5420
425 - 15th Street, OAKLAND 12, Phone GLencourt 1-7300
900 Wilshire Blvd., LOS ANGELES 17, Phone MAdison 6-0611
1009 Jay Street, SACRAMENTO 14, Phone HUdson 1-1407
3018 Central Avenue, PHOENIX, ARIZONA, Phone 6-8445

Giving a lift to the West

THE needs of western industry call for immense quantities of Kaiser Steel Pipe . . . which is used in a wide variety of ways.

For example, Kaiser Steel Pipe is required for such diverse uses as hydraulic car lifts, pump columns, structural columns, feeder lines, residential gas mains, pipelines to transport gas, oil and water.

Kaiser Steel Pipe is also used for plumbing, heating and ventilating systems in homes, schools, hotels, apartments and factories.

To meet all these needs, Kaiser Steel produces a complete range of pipe as part of its diversified line of steel products . . . providing a nearby, dependable source for industries that serve you.

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • tin plate • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • ingot molds • coke oven by-products For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

revenue of all companies involved is estimated to be over $45,000,000 for 1953. Combined companies will have more than 4,000 employees and over 3,000 pieces of equipment.

P-I-E also plans expansion of its facilities in Los Angeles, where new $1,500,000 terminal is planned on 25-acre site, and Emeryville (Oakland), where 7 acres adjoining present terminal have been acquired for new construction. West Coast Fast Freight recently began 18-month, $10,000,000 program of real estate purchase, building construction and equipment modernization. Terminals are being built at Sacramento, Tacoma, Wash., and Salem, Ore., and construction is planned on property acquired at Missoula, Mont.

HUFFORD NEWS — Hufford Machine Works, Inc., El Segundo, sets up new electronic division, located in 10,000 sq. ft. plant at 2201 Carmelina Ave., Los Angeles. Division will develop and produce amplifiers, amplifier controls and transformers, under direction of B. J. McComb, chief engineer, and has been awarded large Navy contract. Hufford also plans manufacture of flexible stretch form block developed by Northrop Aircraft, Inc., as attachment for Hufford stretch presses, which will be produced at El Segundo plant under an exclusive license from Northrop.

ADD PRODUCT—Rabsco Plastic Specialties, Inc., begins manufacture of a new product, precision spray masks, at its Hawthorne plant.

RESEARCH STARTS — Steelbilt, Inc., Gardena, opens research engineering division, headed by Henry P. Sanders, for testing and perfecting new method of weather-sealing horizontal sliding steel frames. Division will also work on marketing light-weight steel joists and trusses having pre-calculated load bearing capacities.

STANDARD OIL PROGRAM — Standard Oil Co. of California will build catalytic reformers at its Richmond and El Segundo plants, as part of a $30,000,000 program for upgrading motor gasolines.

BUY PLANT IN MID-WEST — Norris-Thermador Corp., Los Angeles, buys A. F. Lindemann and Hoverson Co., Milwaukee, Wisc., appliance firm, for $1,700,000. Norris-Thermador manufactures automobile wheels, steel tanks, electric stoves, water heaters, freezers and refrigerators, with annual sales volume of $70,000,000. Company may transfer production of some of its products to Milwaukee.

TECHNICAL ADDS PRODUCT—Technical Industries, Inc., Pasadena, acquires transformer division of Mullenbach Electrical Manufacturing Co., Los Angeles. Plans are under way to move company's operations from Pasadena to 2248 E. 37th St., Los Angeles, adjacent to transformer division, and to expand line of transformers.

WEST COAST PLANT—J. I. Holcomb Co., Indianapolis, plans construction of $300,000 branch plant in Los Angeles, for manufacture of cleaning chemicals, waxes and brushes for industry. Company now has sales office and warehouse in that city.

OUTPUT SPURTS — Clary Multiplier Corp., Los Angeles, will start $6,147,120 production program of guided missile components in November, extending into 1954, which will more than double company's output rate. Order for $1,250,000 in new instruments was completed last month and another order for same amount will be finished by November. Company's instrument division was organized last June 1 under Paul Meeks, rocket engineer.

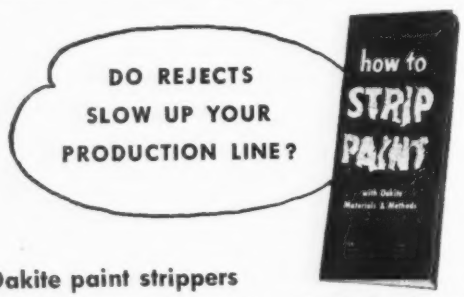
ACQUISITION — Pettibone-Mulliken Corp., Chicago, acquires assets of Wood Manufacturing Co. of North Hollywood, to operate as wholly-owned subsidiary.

TO BUILD IN WEST—Bush Manufacturing Co., Hartford, Conn., manufacturer of air conditioning and refrigeration equipment, will build plant in Riverside to supply Western market.

SWEET ADELE—Adele Candy Co. is formed in San Francisco and will begin production of chocolates and confectionery around December 1, in leased 3-story, 55,000 sq. ft. plant. President of new firm is Theodore A. White, vice president and general manager of Sierra Candy Co., and vice president is Neal V. Diller, president of Chase Candy Co., St. Louis, Mo.

BUY PLANT SITE — Telecomputing Corp., Burbank, buys 5½ acres of land in North Hollywood for construction of 25,000 sq. ft. plant, first unit of planned 100,000 sq. ft. facility. Upon completion of this $400,000 unit next year, firm will give up part of its presently leased 23,000 sq. ft. plant in Burbank, ultimately moving entire operations to North Hollywood.

SITE OPTION—Union Oil Co., Los Angeles, takes option on 3,250 acres on ocean front northwest of Santa Maria,



Oakite paint strippers
may help you break the bottleneck

When painting rejects slow production, you may need one of the stripping methods described in "How to STRIP PAINT", a free booklet which answers many questions about effective stripping procedures. For example:

¶ What's the cheapest way to strip metal parts in large volume? *See page 9.*

¶ What strippers are best for removing oil-base paints?... Synthetic enamels, alkali-resistant plastics or resin-base paints?...Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

FREE For a copy of "How to STRIP PAINT" write to Oakite Products, Inc., 1001 E. First St., Los Angeles, or 681 Market St., San Francisco, Calif.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

SEAL OF PROVEN PERFORMANCE

Modernair
TRADEMARK

AIR/FLUID POWER EQUIPMENT SPECIALISTS

VALVES - CHUCKS - CYLINDERS - SILENCERS - SOLENOIDS
HYDRAULIC PUMPS - COMPRESSORS - PILOTS - AIR CONTROLS
MACHINE FEEDS - CLAMP CYLINDERS - QUICK EXHAUSTS
WRITE FOR CATALOG
STOCKS IN PRINCIPAL CITIES

Modernair **CORPORATION**
400 PREDA STREET • SAN LEANDRO, CALIFORNIA

as possible site of refinery for preliminary processing of crude oil. Plant will be part of company's program to obtain greater yield of gasoline and higher octane values. Construction will not start this year.

ENLARGE GRAIN TERMINAL—Port of San Francisco opens new grain elevators, a second hydraulic truck ramp and automatic bulk-loading equipment at Islais Creek Grain Terminal, doubling storage and shipping facilities built four years ago. Total elevator storage capacity is now 1,000,000 bushels. Hydraulic dumper unloads 22-ton truckloads of grain into elevator in a few minutes. From there it moves by conveyors and marine spouts to ship's hold at 200-ton-an-hour rate. Maximum ship load is usually about 10,000 tons.

VITA-PAK FORMS — Vita-Pak Foods, Inc., is organized to take over canning plant at Upland and will can orange juice, grapefruit juice, fruits, tomatoes and related products. New line of fine foods packed in glass jars will be added.

FRUIT MARKETING—Mutual Orange Distributors, citrus cooperative, withdraws from citrus processing field. New independent marketing concern, Real Gold Co., will market food products under Real Gold label. Oranges will be processed at Real Gold Citrus Products' plant at Anaheim and lemons at Ventura Processors plant, Ventura.

200,000,000 MILK CONTAINERS — American Can Co. begins alterations and 10,000-sq. ft. addition to its Stockton plant to install fibre milk container manufacturing unit, scheduled to begin operation in spring of 1954. Unit will employ over 150 persons and have rated capacity of up to 200,000,000 fibre milk containers per year. Equipment will include presses for printing customer labels. American Can now has milk container manufacturing operations at its factories in San Francisco and Los Angeles.

STREAMLINED ABC—ABC Aluminum Body Corp., manufacturer of custom-built all-aluminum trailers and truck bodies, moves into modern 45,000 sq. ft. plant in Montebello (East Los Angeles).

PRIVATE ATOM POWER FIRM—Incorporation papers are filed with Secretary of State for prospective firm, Western Atomic Power, Inc. Directors named are San Diegans Charles R. Considine, John D. O'Bryan and Peggy V. Gurney. Planned operations are said to be a major project connected with government and highly secret.

WESTERN LITHOGRAPH SOLD — Brown and Bigelow, St. Paul, Minn., buys Western Lithograph Co., Los Angeles. Firm will continue to operate as separate corporation under present name. John L. Davidson, former executive vice president, becomes president, and W. L. Heinrich, comptroller of Brown and Bigelow, becomes treasurer of Western Lithograph.

SUN TUBE PLANT CLOSES — South San Francisco plant of Sun Tube Co. closes and is put up for sale. Company, which manufactures collapsible tubes, will supply West Coast customers from eastern plant. Sun Tube bought 45,000 sq. ft. plant in 1950 from Rough Rider, Inc., for $300,000.

PLAN BEYOND TIN MILL—Yolo Steel and Metals Co., Sacramento, which has been issued certificate of necessity by Office of Defense Mobilization for $11,000,000 electrolytic tin plate mill, plans additional future construction of $44,405,000 pig iron plant and $81,250,000 finishing mill. Between 6,000 and 7,500 workers would be employed in integrated mills. Company states it is now financing the over-all project, holds options on three possible sites along proposed Sacramento-Yolo deep water channel, and already has iron ore resources in Shasta and Madera Counties.

NEW DOORS—Packard Bell Co., Los Angeles, manufacturer of TV and radio equipment, starts production of doors at its former cabinet plant, Dimension Mill & Cabinet Co., Santa Ana. Newly equipped plant now has capacity of 500 hollow-core veneer and masonite doors per day, to increase by fall to 1,200 doors per day. Design of special lattice-type hollow-core door was worked out with cooperation of Stanford Research Institute. Allied Veneer & Lumber Co., Los Angeles, is Southern California distributor for new line. Cabinet fabrication for Packard-Bell's products is now integrated with other manufacturing divisions at company's main plant in West Los Angeles.

9% SALES GAIN—Sales of Westinghouse Electric Corp. in West increased 9% in first half of 1953 over same period last year. TV and radio receivers, elevators, air conditioning equipment

THE biggest value FOR WESTERN BUILDING!

A SINGLE BUILDING or an ENTIRE FACTORY

CLEAR-SPAN DESIGN

EFFICIENCY IN BUILDING — *that's why Soulé Standard Buildings are in great demand. The popularity of these low cost structures has grown year-by-year. Since the beginning Soulé has been the choice of Western industry — so much so that more Soulé Buildings are purchased than all other prefabricated structures combined. If you build with permanence and price in mind, you'll buy Soulé, too!*

- EXTRA-STRONG All-Bolted STEEL RIGID-FRAME
- FASTER ERECTION • A SURE WAY TO SAVE WISELY • MAXIMUM USABLE SPACE
- PROVIDES FOR EASY ADDITIONS

Soulé Standard Buildings Exceed Uniform Building Code Requirements

Write or Phone for CATALOG
QUOTATIONS FURNISHED WITHOUT OBLIGATION

Soulé STEEL BUILDINGS
ANY SIZE • ANY WINDOW AND DOOR ARRANGEMENT

Mfd. by SOULÉ STEEL CO.

SAN FRANCISCO — *1750 Army Street, VAlencia 4-4141*
LOS ANGELES — *6200 Wilmington Ave., LAfayette 0911*
PORTLAND — *2630 N.W. St. Helens Rd., BEacon 5154*
SEATTLE — *4100 W. Marginal Way, HOlly 3600*

SS-236

FABRICATORS OF STEEL BUILDING PRODUCTS SINCE 1911

and electric appliances, in that order, account for sales gain. Sales of apparatus such as turbine generators, transformers, switchgear and electric motors continued at last year's high rate. Total sales for 1953 are expected to reach new high for company's Pacific Coast District, which in addition to coastal states includes Arizona, Idaho, Nevada, Utah, most of Montana, western Wyoming, and Hawaii and Alaska.

POSSIBLE EXPANSION — Survey is under way by General Electric Co. to determine whether its wire and cable plant at Oakland will be expanded and new products added.

MORE AIRFOAM — Goodyear-California, Los Angeles, begins expansion of Airfoam department which will increase capacity from 5,000,000 to 8,500,000 lb. annually. Plans call for underground latex storage tank and additional drying unit.

DISTRIBUTOR FOR ENGLISH FIRM— Pacific Airmotive Corp., Burbank, becomes exclusive U.S. distributor for Sir George Godfrey and Partners, Ltd., of England and its Canadian subsidiary, Godfrey Engineering Co., Ltd. Godfrey manufactures aircraft temperature-control equipment.

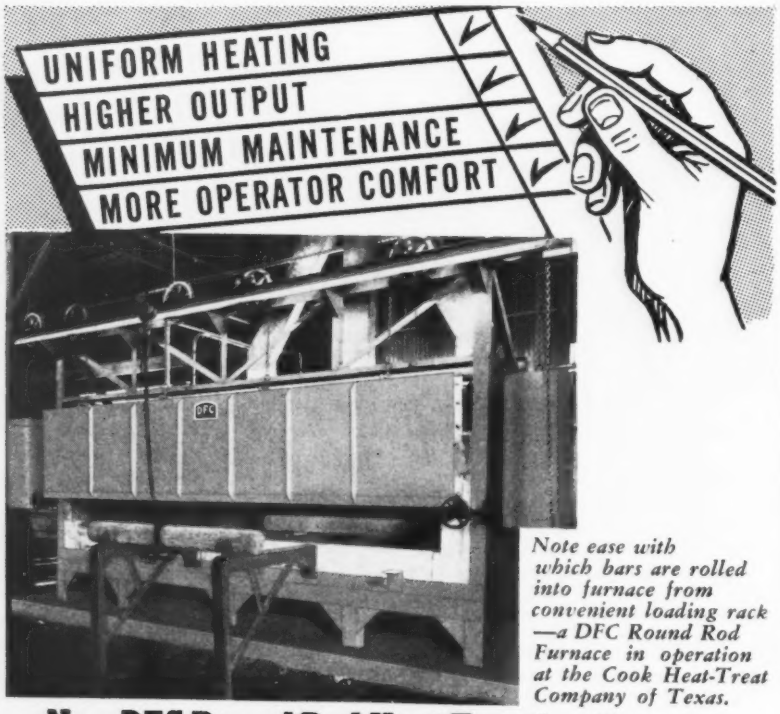
ENLARGE COLOR LABORATORY — Color Corp. of America expands production facilities at its Burbank laboratory, with cost to date of over $250,000, and sets up eastern office in Philadelphia to serve industrial film market. Improvement program at Burbank includes new 16 mm. division and equipment. Firm anticipates processing 12,000,000 footage in industrial film in addition to 53,000,000 footage in motion picture industry.

EASTERN LICENSEE — Shell Development Co., Emeryville, licenses Pfaudler Co. of Rochester, N.Y., to manufacture turbogrid trays. Developed by Shell, turbogrid trays are new type of vapor-liquid contacting tray used in distillation columns for aromatics recovery, catalytic cracking gas recovery, and ammonia, crude oil and natural gas plants.

REA LOAN GRANTED—Death Valley Electric Co-operative, Baker, receives $2,035,000 loan from Rural Electrification Administration, for construction of power distribution and transmission lines in San Bernardino and Inyo Counties and Nye County, Nev. System will serve 341 rural consumers and reach parts of Amargosa River Valley and Kingston Valley, in Mojave and Death Valley deserts, where interest is high in developing irrigation projects.

ZERO ADDS—Zero Manufacturing Co., Burbank, builds new 5,000 sq. ft. plant addition to house $100,000 worth of new equipment for expanding metal-working operations in electronics field. This is company's third building expansion since it was organized about a year and a half ago.

LEASE AIR BASES — Blythe Aircraft Corp., organized by Alhambra group headed by Jack Lane, president of American Pipe and Steel Corp., leases Blythe and Hemet air bases in Southern California. Company plans to use part of facilities for its own operations and rent or sublease remainder to commercial firms or government agencies requiring airstrip or ground installations for training, air shipping, or research and development.



Note ease with which bars are rolled into furnace from convenient loading rack —a DFC Round Rod Furnace in operation at the Cook Heat-Treat Company of Texas.

New DFC Round Rod Heat Treating Furnace

Slot-type furnace, takes rods 3 inches to 10 inches in diameter, up to 15 feet long. Shallow enough for fast, easy loading and unloading.

SIX WAYS BETTER

- Twelve evenly spaced DFC gas burners firing into the back insure even distribution of heat.
- Six flues located at rear of the furnace, one for each pair of burners, further improve heat distribution.
- Special burner manifold design permits close zone temperature control for each half of the furnace.
- Bars roll in on silicon carbide heat and abrasion resistant refractory rails built into the hearth.
- Designed to permit free circulation of heat around the entire surface of rods being treated.
- DFC monolithic refractory arch is fully suspended and anchored.

Write for complete information

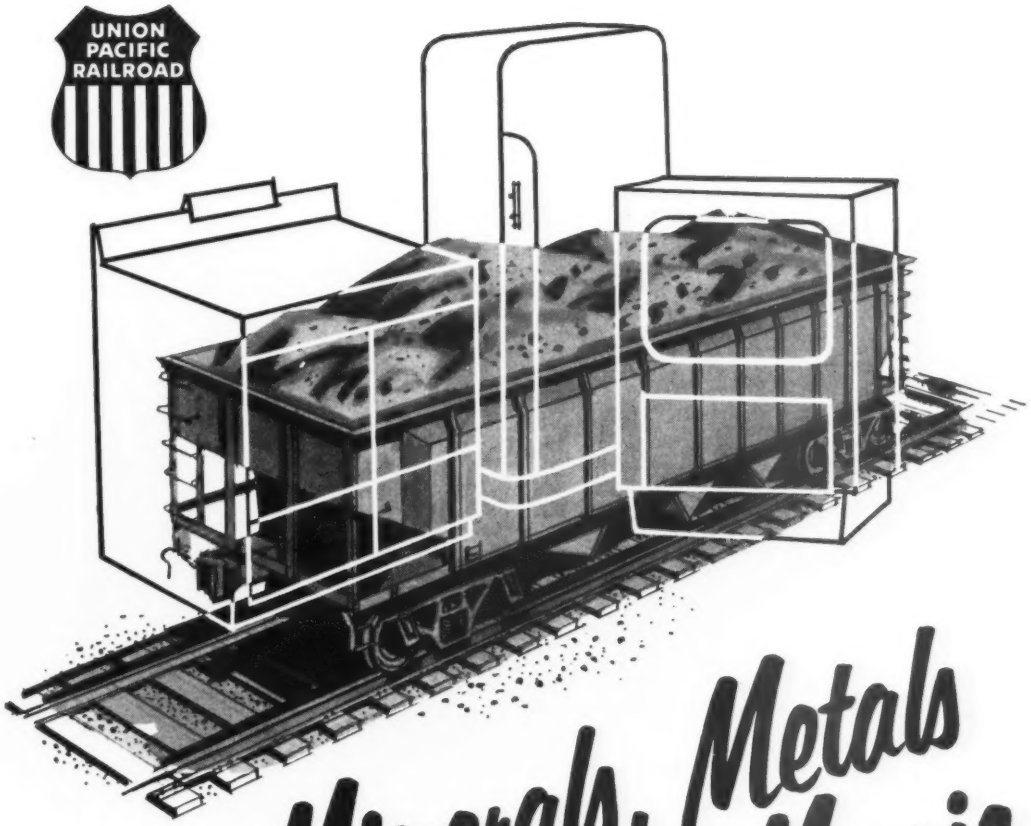
DFC
The DENVER FIRE CLAY Company
2301 BLAKE STREET • DENVER, COLORADO
SALT LAKE CITY • EL PASO • ALBUQUERQUE

COLORADO

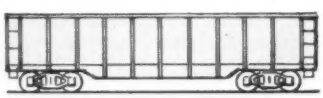
LIQUID HYDROGEN—National Bureau of Standards places in operation at its Boulder site a liquid-hydrogen plant and cryogenic (low-temperature) laboratory for large-scale production of liquefied gases and testing of materials for low-temperature use. New $3,500,000 facilities are located on 210-acre tract and consist of two concrete buildings with total floor space of 34,000 sq. ft., auxiliary buildings and test sites.

FIELD EXPERIMENT—Oil shale properties about 17 air miles from Rifle are site of small field experiment being conducted by Sinclair Research Laboratories, New York, to determine possibilities of extracting oil from shale. Bureau of Mines has oil shale experiment station at Rifle.

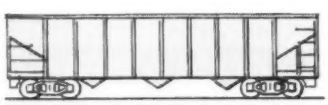
MODEL PLANT — Carlson-Frink Co. plans construction of $500,000 dairy plant in Denver, to be completed in 1954. Two-story building will house complete milk operations of company, allowing present plant to be remodeled for manufacture of ice cream and special dairy products. Construction work will begin as soon as Canada Dry Bottling Co., now occupying site, moves to its



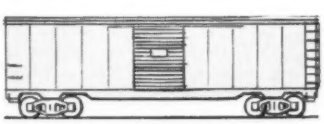
Minerals, Metals and Magic



The gondola car for shipment of metals.



The hopper car for shipment of minerals.



The box car for shipment of finished products.

The magic of American industry converts the earth's hidden treasures into time-and-work-saving devices that lighten household tasks and make possible more hours of leisure.

The magic of American railroading transports the raw materials to industrial plants . . . also provides a safe, dependable means of shipping the finished products to distributors and dealers.

★ ★ ★

Union Pacific is continually adding to its great fleet of cars of all types to assure efficient on-time deliveries for the constantly growing household appliance industry and the many other shippers depending on Union Pacific freight service.

UNION PACIFIC RAILROAD

new location. Carlson Frink recently completed plants in Boulder and Colorado Springs.

NEVADA

NEW CHEMICAL PLANT — Hadsel Products, Inc., plans to build new chemical plant at Wells to process lead-zinc-barite ore from Polar Star mine 27 miles south. Company is Nevada firm headed by A. D. and Dan Hadsel of Auburn, Calif.

NEW MEXICO

PLANT AT SHIPROCK—Atomic Energy Commission awards contract for construction and operation of $3,000,000 uranium processing plant at Shiprock to Kerr-McGee Co. of Oklahoma, acting for its subsidiary, Navajo Uranium Corp. Plant is scheduled to begin operation in 1954, and is 10th uranium processing plant in operation or under construction in this area. Stockpile of ore has been accumulated at AEC's uranium sampling plant at Shiprock to supply new plant.

$500,000 ADDITION—El Paso Natural Gas Co. begins construction of $500,000 addition to San Juan processing plant, Farmington, for production of block sulphur. Capacity of entire plant, to be operated by Imperial Acid & Sulphur Co., Albuquerque, will be 70 tons daily, reportedly third largest in country.

OREGON

PRODUCE PLASTIC PIPE — Carlon Products Corp., Cleveland, opens plant at Klamath Falls for manufacture of plastic pipe and fittings to supply Western markets. Manager of new division is Floyd Wilson.

MORE POWER — California Oregon Power Co. orders two power plants, consisting of waterwheel generators, transformers and switchgear, from Westinghouse Electric Corp., for Lemolo No. 1 and No. 2 generating stations on North Umpqua River east of Roseburg. Lemolo No. 1 is scheduled to begin operation in 1954, with 29,000-kw. capacity; No. 2 in 1955, with 33,000-kw. capacity.

OIL FACILITY—Union Oil Co. of California will build $450,000 oil-blending facility at its Willbridge, Ore., plant. Facility will include blending and homogenizing equipment, storage tanks, barrel conveyor, pipelines and related installations, and will be supplied by tankship.

LARGER QUARTERS — Associated Wood Products Co. of the Northwest, Portland, moves to 70,000 sq. ft. plant formerly occupied by Ford & Ford Lumber Co., and adds $90,000 worth of special equipment. Separate building houses executive, sales and engineering offices. Associated Wood manufactures glued laminated beams and arches.

CEMENT FIRM EXPANDS — Oregon Portland Cement Co., Portland, undertakes $1,000,000 expansion of its plant at Lime. Rock conveying and crushing capacity will be increased and kiln firing system modernized, with a view to supplying cement needed for Snake River dams now under review by FPC. Initial phase of project will be completed by end of year.

POWER CONTRACTS — Bonneville Power Administration distributes, for comment by industry, drafts of proposed 20-year contracts with private utilities allocating total of 1,500,000 kw. of hydroelectric power. First priority continues to go to public agencies and cooperatives, with no allocation limitation. Second will be heavy industries supplied directly. Third will be private companies. Proposed contracts will withhold further power for industrial expansion until allocation to private companies equals industrial commitments.

KELVINATOR MOVES—Kelvinator division of Nash-Kelvinator Sales Corp., Portland, leases 33,000 sq. ft. warehouse and office building from Lyon Van & Storage Co. New headquarters provide about one-third more space for expanded business.

ADHESIVE PRODUCTS — American-Marietta Co., Seattle, buys remaining interest in Adhesive Products Co., Portland, which has been under its management since March, from United States Plywood Corp.

HANFORD SUBCONTRACT—Jaggar-Sroufe Co. of Portland shares with New York firm a joint venture subcontract for electrical work on AEC's chemical processing plant at Hanford, Wash. Subcontract, totaling $2,600,000, was awarded by Blaw-Knox Co. of Pittsburgh, Pa.

PLYWOOD PLANT — Beaver Plywood Co-operative, Salem, plans to build new plant on 15-acre site north of Independence, and has begun work on mill pond.

TO PRODUCE BURNED LIME — New corporation, Chemical Lime Co., is organized in Baker by Anthony Bradenthaler and Portland associates, with $500,000 capital, to produce burned high-calcium pebble chemical lime. Rotary-type kiln, 118 ft. long and 7¾ ft. in diameter, now being installed will be supplemented next year by two kilns of equal size. Each will have annual capacity of 66,000 tons of raw rock. Entire output of chemical lime has been contracted for.

CITY BUYS TERMINAL—City of Portland, Commission of Public Docks, purchases West Coast Terminals for $600,000 and plans to repair and modernize 20½-acre plant. Commission's engineers estimate initial cost of placing three ship berths in good condition at $300,000, with an additional $400,000 for renovation of entire terminal. Property will be integrated with adjacent Wisco terminal acquired by city four years ago, now known as Terminal No. 2. Meanwhile, Commission will operate newly-acquired terminal.

FORECAST—President Richard S. Reynolds, Jr., of Reynolds Metals Co., Richmond, Va., states that his firm will ultimately build aluminum fabricating plant in Northwest to supply expanded Western demand. Statement was made in Portland on Reynolds' tour of company's Western plants.

UTAH

MAY CHANGE CHARTER—Independent Coal and Coke Co., Salt Lake City, asks its stockholders for approval of change in company's charter to permit entrance into petroleum and gas business. Independent Coal and Coke holds half interest in 320 acres of Clear Creek, Carbon County, natural gas field.

START PRODUCTION — Stratosphere Products Corp., Los Angeles, begins operations at its new anti-freeze plant in Salt Lake City, which has a design capacity of 40,000 gal. of anti-freeze daily.

SCANNING SITES—Columbia-Southern Chemical Co., subsidiary of Pittsburgh Plate Glass Co., surveys possible locations in Utah for liquid chlorine plant. Representatives of firm reportedly have held exploratory conversations with Deseret Salt Co. concerning purchase of that firm's property and equipment on Great Salt Lake, which would assure salt supply for chlorine plant's operations.

PRISON LUMBER MILL—Board of Examiners, State of Utah, approves purchase of sawmill equipment for state prison's proposed lumber mill, with limitation that no lumber can be sold to private individuals or firms. Planned use is for prison construction, with surplus going to other state agencies. About 1,000,000 bd. ft. of timber has been purchased, and work camp will be set up about 40 mi. north of Duchesne. Sum of $10,000 has been allocated to this state project.

WASHINGTON

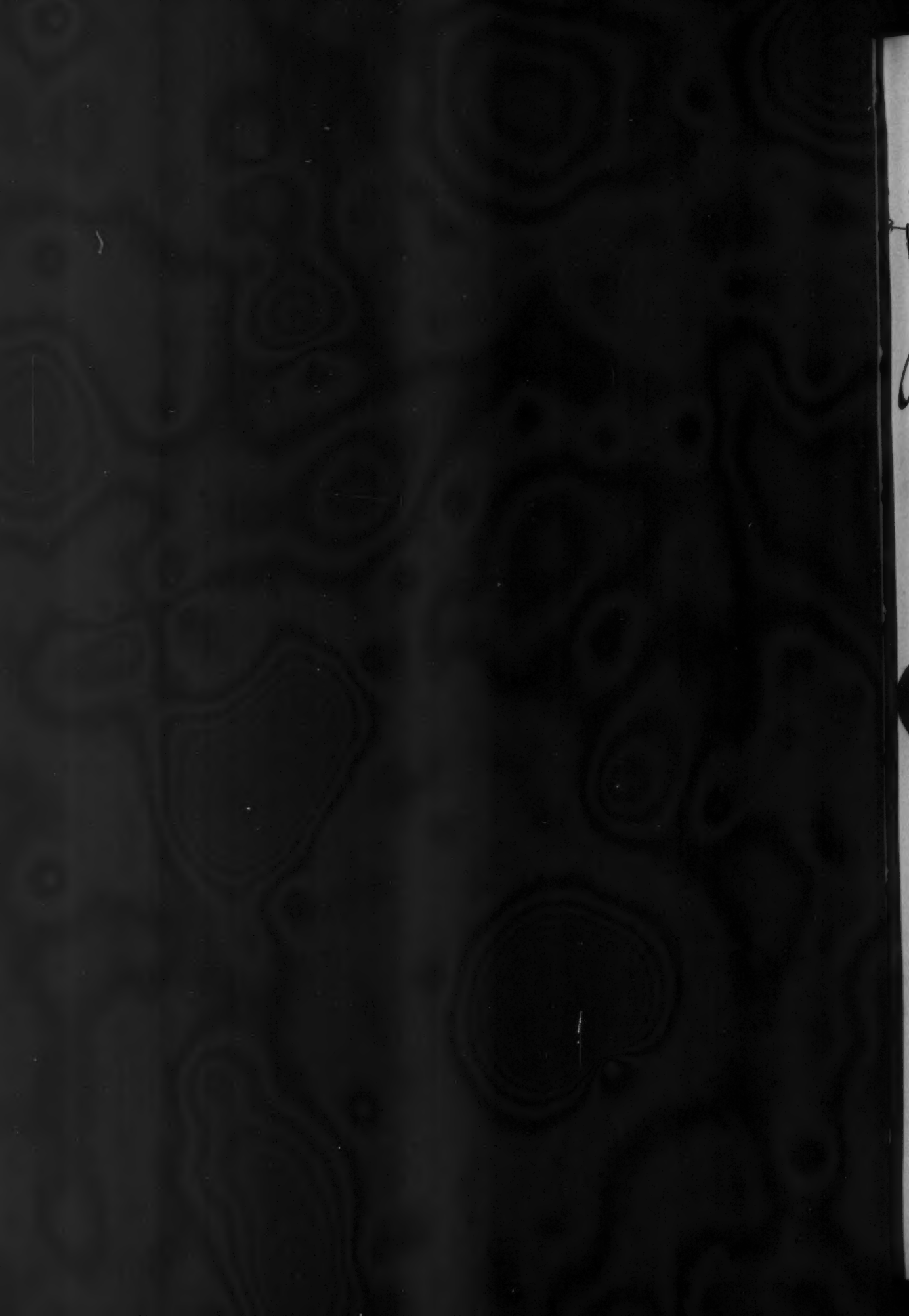
TO EXPAND — Skagit Steel and Iron Works of Sedro-Woolley plans $2,500,000 expansion of plant facilities in order to handle Army contract for ordnance items. Contract exceeds $3,000,000.

PARKING INVENTION — New firm, Parkmaster Systems, Inc., is organized by Spokane group to manufacture and sell multiple-tier parking devices, utilizing two-car elevator equipped with turntable. William J. Porter, inventor, is president of new company and William G. Ennis is secretary-treasurer. Financing is currently under way.

WYOMING

NEW COAL MINE—Gunn-Quealy Coal Co. will open a new mine, Rainbow No. 3, at Quealy, five miles southwest of Rock Springs. Mine, to employ about 50 men, will produce about 1,000 tons daily in stripping operations.

FPC APPROVAL—Federal Power Commission approves purchase by Lower Valley Power and Light, Inc., Freedom, of all stock of Jackson Hole Light and Power Co. and Star Valley Power and Light Co., Afton. Purchase price of Jackson Hole stock is $310,000 and for Star Valley $285,000. Transactions received approval of Wyoming Public Service Commission earlier this year.



Low Carbon Cold Rolled Strip • Electro Zinc Coated Strip • Shim Stock • Tin Coated Steel • Paint-Ioc and Zinc Bond Hot Dip Galvanized Sheets
Spring Steel Annealed Strip • Spring Steel Tempered Polished • Stainless Annealed & Intermediate Tempers • Stainless Hi-Tensile
Flat Wire 4130 Aircraft Quality Sheets and Plates • Wire (Gutter Broom) Tempered • Also custom slitting service for your metals
What a Line
A FULL WAREHOUSE FOR FAST SERVICE
Largest stocks on the West Coast of many uncommon products, such as Bright Annealed Stainless strip (even in dead soft temper), makes possible fast handling of our customers' needs. Why don't you give us a try?
CMP
THINSTEEL

FOR HELPING USERS OF FLAT ROLLED METAL PRODUCTS

Everything you see is "in stock." Of course, we mean the complete line of specialized steel products. There's one thing sure about doing business with CMP, you won't wash us out for lack of quality that provides you trouble-free production. And when you're "hung up" for unusual requirements you'll no doubt find just what you want in this quick service specialized steel products warehouse.

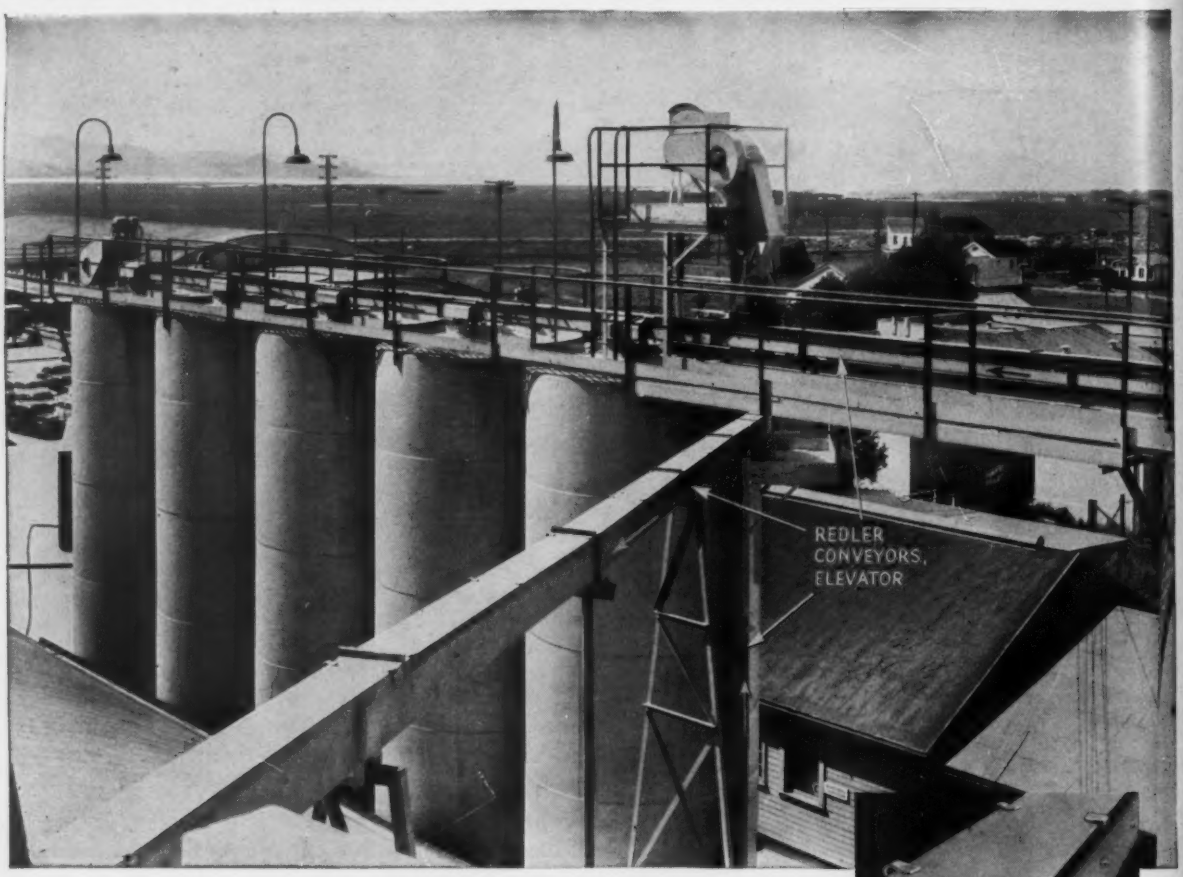
Telephone PLeasant 3-1291

the Cold Metal Products co. of California

6600 McKINLEY AVENUE • LOS ANGELES

POSTMASTER:
"Form 3547 Requested"
WESTERN INDUSTRY
609 Mission Street
San Francisco 5, Calif.

Acceptance under
Section 34.64 P. L. & R.
Authorized

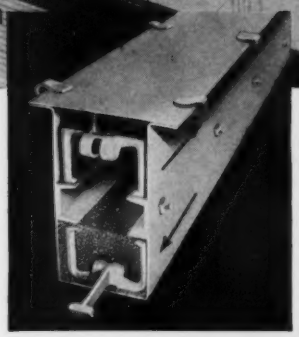


NO WEATHER DAMAGE!
NO SPILLAGE!
NO CONTAMINATION!

REDLER Conveyors and Elevators Move, Place and Reclaim Bulk Chemicals Stored in Outdoor Tanks

Insecticide chemicals handled to and from outdoor storage tanks must be fully protected against the elements, foreign materials and loss of volume. S-A engineers provided an installation of REDLER Conveyor-Elevators to assure volume handling with cleanliness, efficiency and economy.

For the past 50 years S-A engineers have dealt successfully with all types of bulk materials handling problems. They have a complete line of bulk handling equipment from which to recommend the exact type of equipment best suited for your needs. *Write for a free survey by an S-A engineer.*



CALIFORNIA SPRAY-CHEMICAL CORPORATION
Richmond, California

At this plant fine-mesh bulk chemicals are deposited in and withdrawn from eight outdoor steel storage tanks. Three REDLER Elevators lift material through enclosed casing to top of tanks and distribute it through a long, horizontal REDLER Conveyor. Other horizontal REDLER Conveyors reclaim chemicals below the tanks for delivery to processing operations.

151 Mission St., San Francisco 5, Calif.
1007 E. Burnside St., Portland 14, Ore.

STEPHEN S-A ADAMSON MFG. CO.
2227 E. 37th STREET, LOS ANGELES 58, CALIF.

Washington Machinery & Storage Co.
7329 E. Marginal Way, Seattle 8, Wash.

Bulk Material Handling Equipment